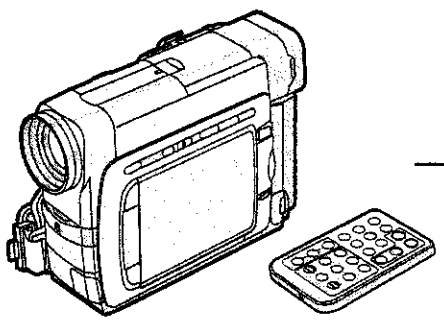
Panasonic

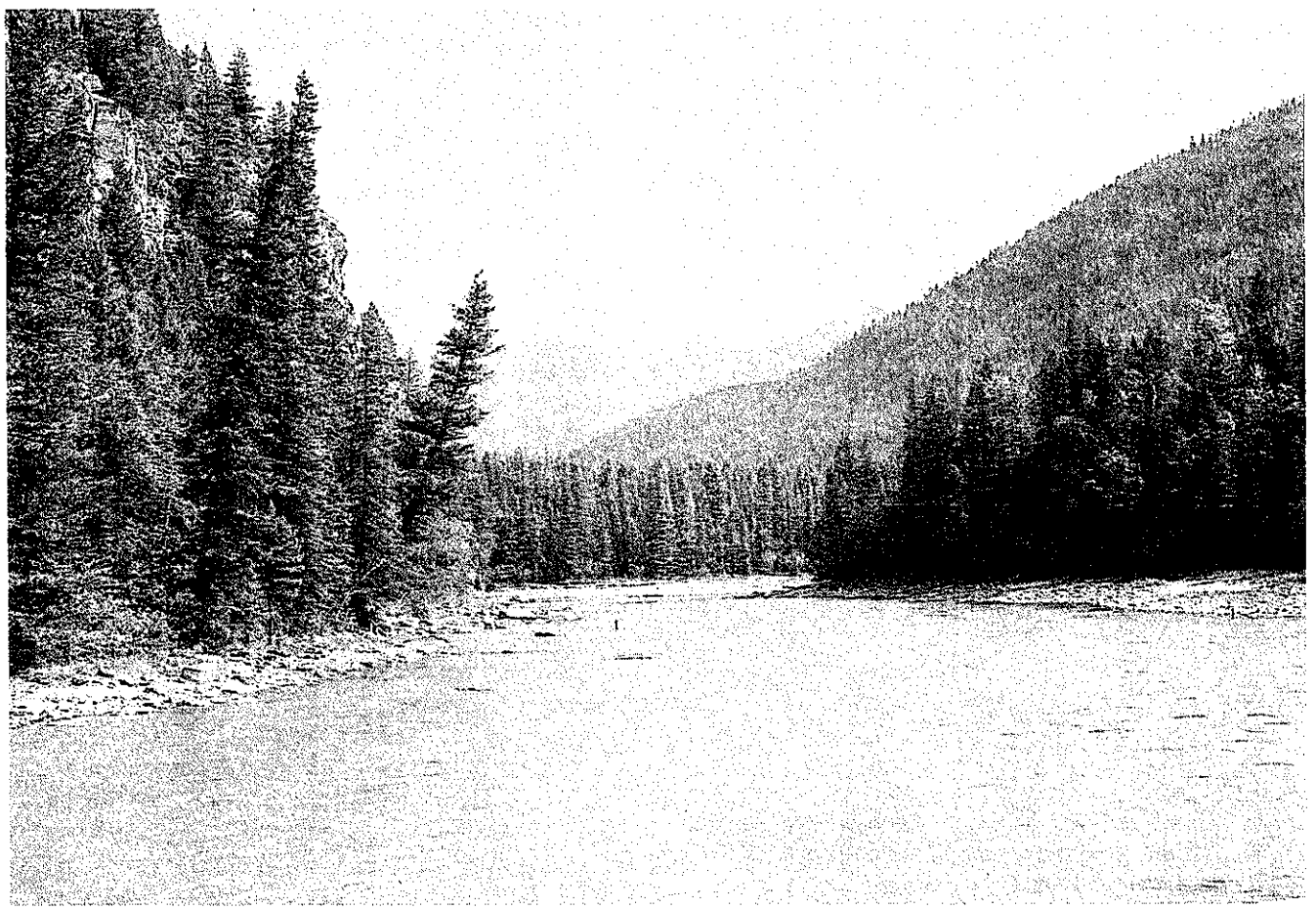
Digital Video Camera

Operating Instructions

NV-DS55A



Model No. NV-DS55A



Mini DV PAL

Before use, please read these instructions completely.

VQT8423

Information for Your Safety

Movie Camera

- **The rating plate is on the underside of the Movie Camera.**

AC Adaptor

- **The rating plate is on the underside of the AC Adaptor.**
- **As this equipment gets hot during use, operate it in a well-ventilated place; do not install this equipment in a confined space such as a bookcase or similar unit.**

■ Carefully read the Operating Instructions and use the Movie Camera correctly.

- **Injury or material damage resulting from any kind of use that is not in accordance with the operating procedures explained in these Operating Instructions are the sole responsibility of the user.**

Try out the Movie Camera.
Be sure to try out the Movie Camera before recording your first important event and check that it records properly and functions correctly.

The manufacturer is not liable for loss of recorded contents.
The manufacturer shall in no event be liable for the loss of recordings due to malfunction or defect of this Movie Camera, its accessories or cassettes.

Carefully observe copyright laws.
Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

- Windows is a trademark or registered trademark of Microsoft Corporation U.S.A. Mac OS is a trademark or registered trademark of Apple Computer Inc.
- All other company and product names in the operating instructions are trademarks or registered trademarks of their respective corporations.

Still Pictures Recorded on the MultiMediaCard
Compatibility cannot be guaranteed for pictures recorded on other video equipment and played back on this Movie Camera, or vice versa.

Pages for reference
Pages for reference are indicated with an arrow, for example: **(➔ 00)**.

■ WARNING

- **To reduce the risk of fire or shock hazard and annoying interference, use only the recommended accessories and do not expose this equipment to rain or moisture. Do not remove the cover (or back); there are no user serviceable parts inside. Refer servicing to qualified service personnel.**

IF THE POWER CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED WITH AN ELECTRICALLY APPROVED POWER CORD.

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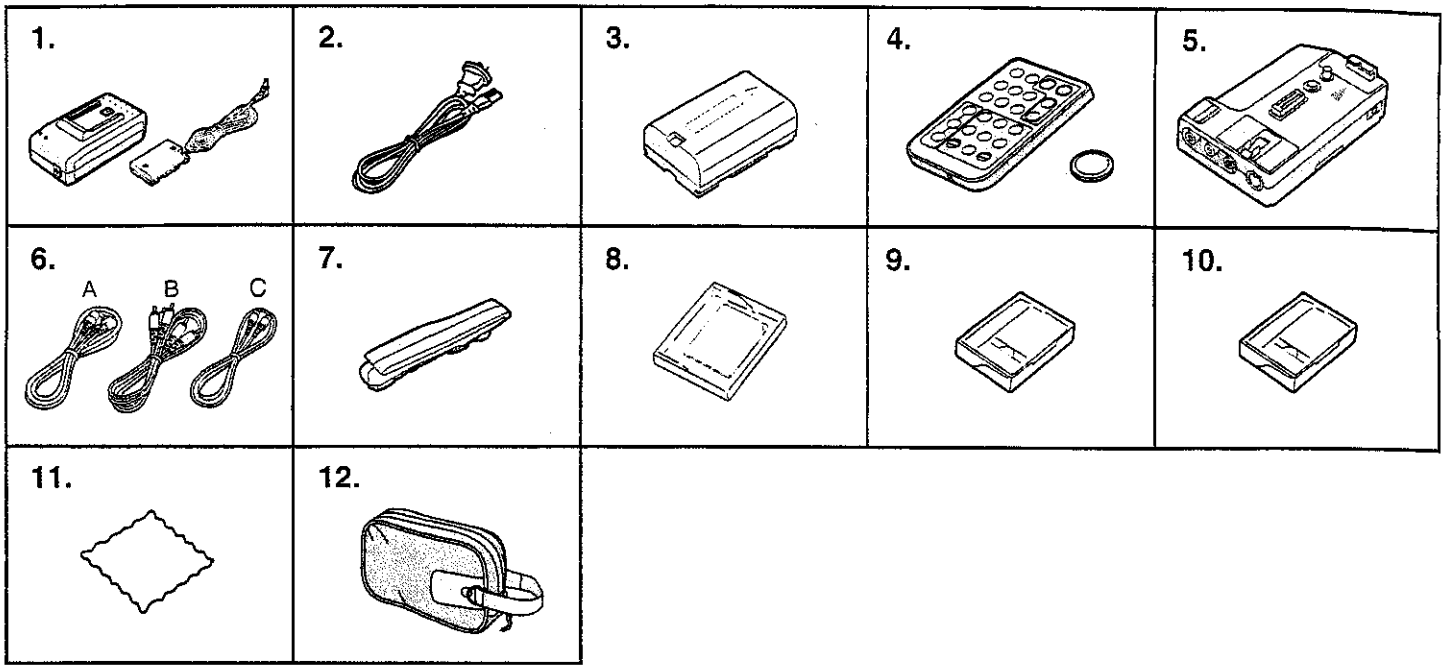
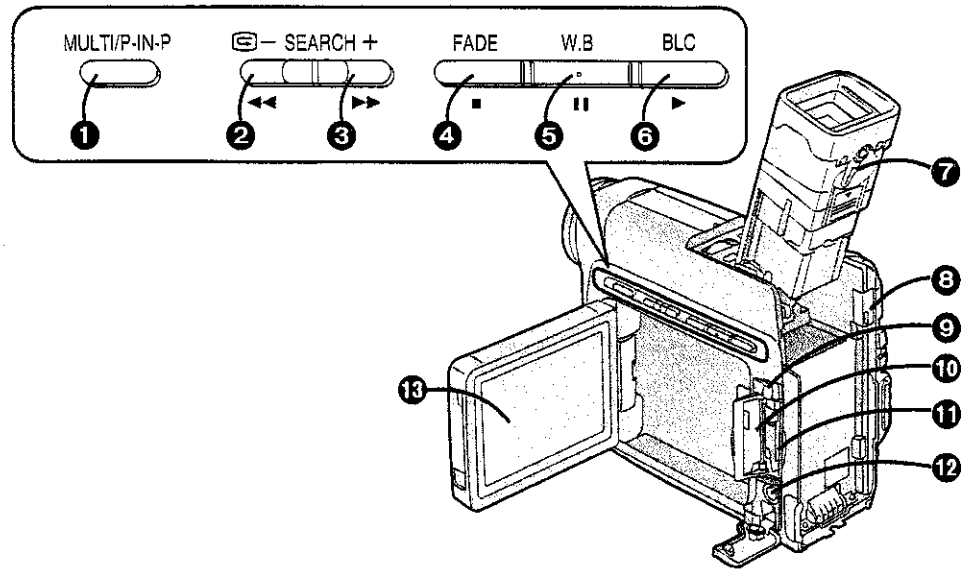


Standard Accessories

1. **AC Adaptor (➜ 8, 9, 102)**
   To supply power to the Movie Camera.
   To charge the Battery.

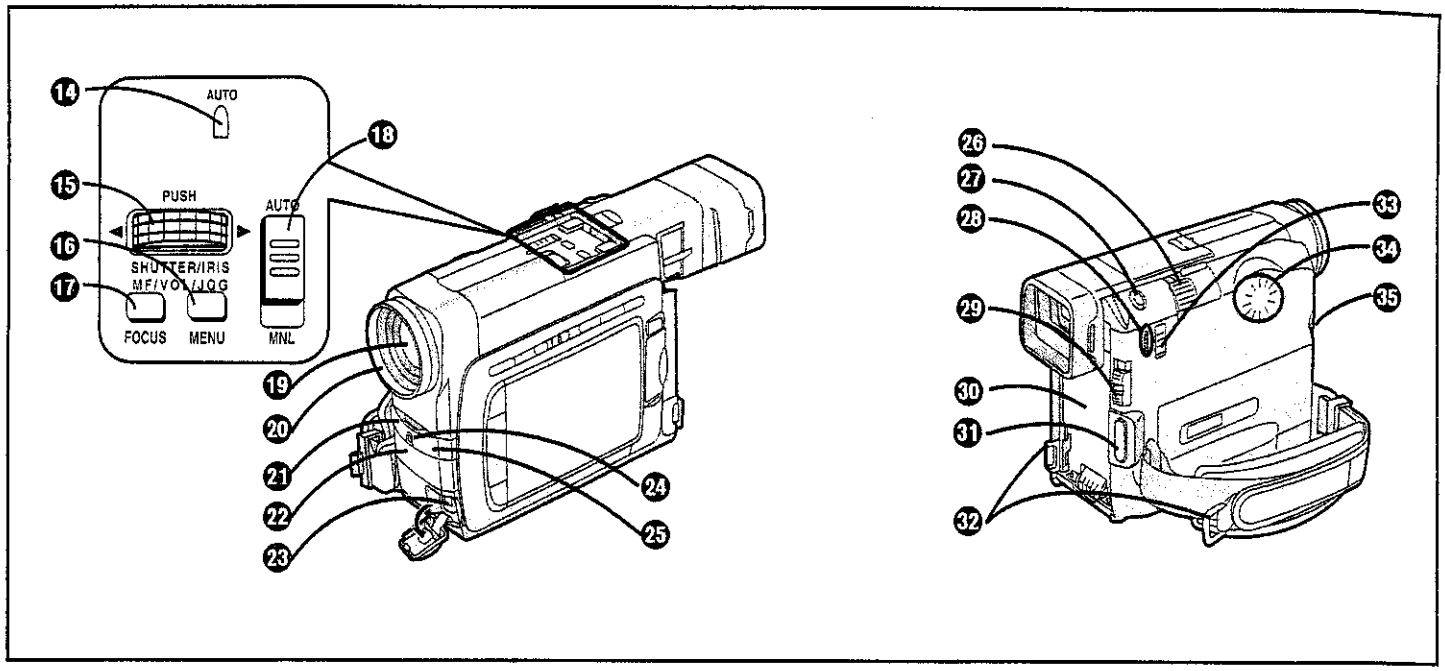
   DC Input Lead (➜ 8)
   To connect the AC Adaptor to the Movie Camera.
2. **AC Mains Lead (➜ 8, 9)**
   To connect the AC Adaptor to an AC mains socket.
3. **Battery Pack (➜ 9)**
   To supply the Movie Camera with power.
4. **Remote Controller and Button-Type Battery (➜ 72, 76)**
5. **Output Terminal Box [AV ONE TOUCH STATION] (➜ 29, 30, 78)**
   Equipped with AV Sockets, Edit Socket, Digital Still Picture Terminal, and Headphones Socket.
6. **A. AV Cable (PHONO-M3) (➜ 29, 78)**
   B. AV Cable (PHONO-PHONO) (➜ 29, 78, 80)
   C. S-Video Cable (➜ 29, 78, 80, 82, 83)
7. **Shoulder Strap (➜ 14)**
8. **MultiMediaCard (➜ 63, 64, 66, 67, 68, 69, 70, 71, 106, 123)**
9. **Mini DV Cassette (➜ 11)**
10. **Digital Video Head Cleaner (➜ 104)**
11. **Cleaning Tissue**
    To clean the Lens and the LCD Monitor.
12. **Soft Bag**
    When not using the Movie Camera or carrying it in the hand, store it in this bag.



Controls and Components

1. **Multi-Picture Button [MULTI] (➔ 42, 43, 54, 55, 56)**
   Picture-in-Picture Button [P-IN-P] (➔ 45)
2. **Reverse Search Button [– SEARCH] (➔ 31, 66)**
   Rewind/Review Button [◀◀] (➔ 25, 26)
   Recording Check Button [⟲] (➔ 16)
3. **Forward Search Button [SEARCH +] (➔ 31, 66)**
   Fast Forward/Cue Button [▶▶] (➔ 26)
4. **Fade Button [FADE] (➔ 36)**
   Stop Button [■] (➔ 25, 66)
5. **White Balance Button [W.B] (➔ 48, 49)**
   Pause Button [❚❚] (➔ 28, 66)
6. **Backlight Button [BLC] (➔ 16)**
   Play Button [▶] (➔ 25, 66)
7. **Eyepiece Corrector Lever (➔ 13)**
8. **Battery Eject Button [BATT. EJECT PUSH] (➔ 9)**
9. **LCD Monitor Open Lever [OPEN] (➔ 13)**
10. **MultiMediaCard Slot Cover [CARD] (➔ 63)**
11. **MultiMediaCard Slot (➔ 63)**
12. **Audio-Video Output Socket [AV OUT] (➔ 29, 78, 107)**
    When a cable is connected to this socket, the Movie Camera's built-in speaker is turned off.
13. **LCD Monitor (➔ 13)**

> Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD Monitor screen. However, this is not a malfunction and does not affect the recorded picture.



⑭ Auto Mode Lamp [AUTO] (➜ 15)
This lamp lights when you set the Mode Selector Switch to [AUTO].

⑮ Multi-Function Dial [PUSH] (➜ 25, 26, 28, 50, 51, 52, 58, 67, 68, 92, 98, 100)

⑯ Menu Button [MENU] (➜ 92)

⑰ Focus Button [FOCUS] (➜ 50)

⑱ Mode Selector Switch [AUTO/MNL] (➜ 15, 37, 48, 49, 50, 51, 52)

⑲ Lens

⑳ Lens Hood (➜ 107)

㉑ White Balance Sensor (➜ 111)

㉒ Microphone (built-in, stereo)

㉓ DV Terminal (i.LINK) [i]
To input/output digital signals.
"i.LINK" is the name of the connector in accordance with the International Standard IEEE1394-1995.
"i" is the logo marked on products conforming with the "i.LINK" specifications.

㉔ Recording Lamp (➜ 15)

㉕ Remote Control Sensor (➜ 77)

㉖ Zoom Lever [W/T] (➜ 18, 19, 49)

㉗ Photoshot Button [PHOTO SHOT] (➜ 20, 21, 64)

㉘ Operation Mode Lamps [CAMERA/VCR/CARD P.B] (➜ 15, 25, 66)

㉙ Off/On Mode Selector Switch [OFF/ON/MODE] (➜ 13, 15, 25, 30, 63, 64, 66)

㉚ Battery Holder (➜ 9, 30)

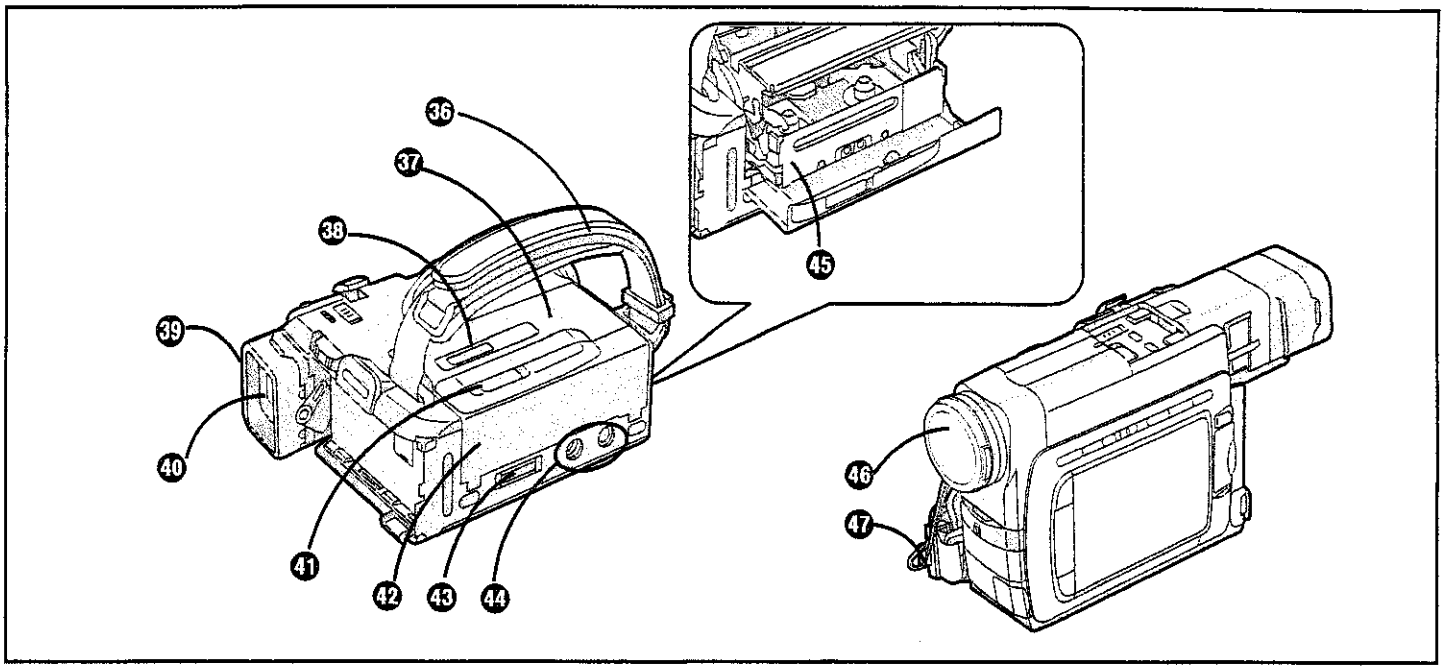
㉛ Recording Start/Stop Button (➜ 15)

㉜ Shoulder Strap Holders (➜ 14)

㉝ Tape/Card Photoshot Selector [TAPE/CARD] (➜ 64, 70)

㉞ Speaker (➜ 25)

㉟ Microphone Socket [MIC] (➜ 107)
To connect an external microphone or audio equipment. (Connecting to this socket deactivates the built-in microphone.)



36 Grip Belt (➜ 14)

37 Upper Cassette Compartment Cover (➜ 11)

38 Cassette Compartment Window (➜ 11)

39 Eyecup

40 Finder (➜ 13)

> Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the Finder screen. However, this is not a malfunction and does not affect the recorded picture.

41 Cassette Eject Lever [OPEN/EJECT] (➜ 11, 30)

42 Lower Cassette Compartment Cover (➜ 11)

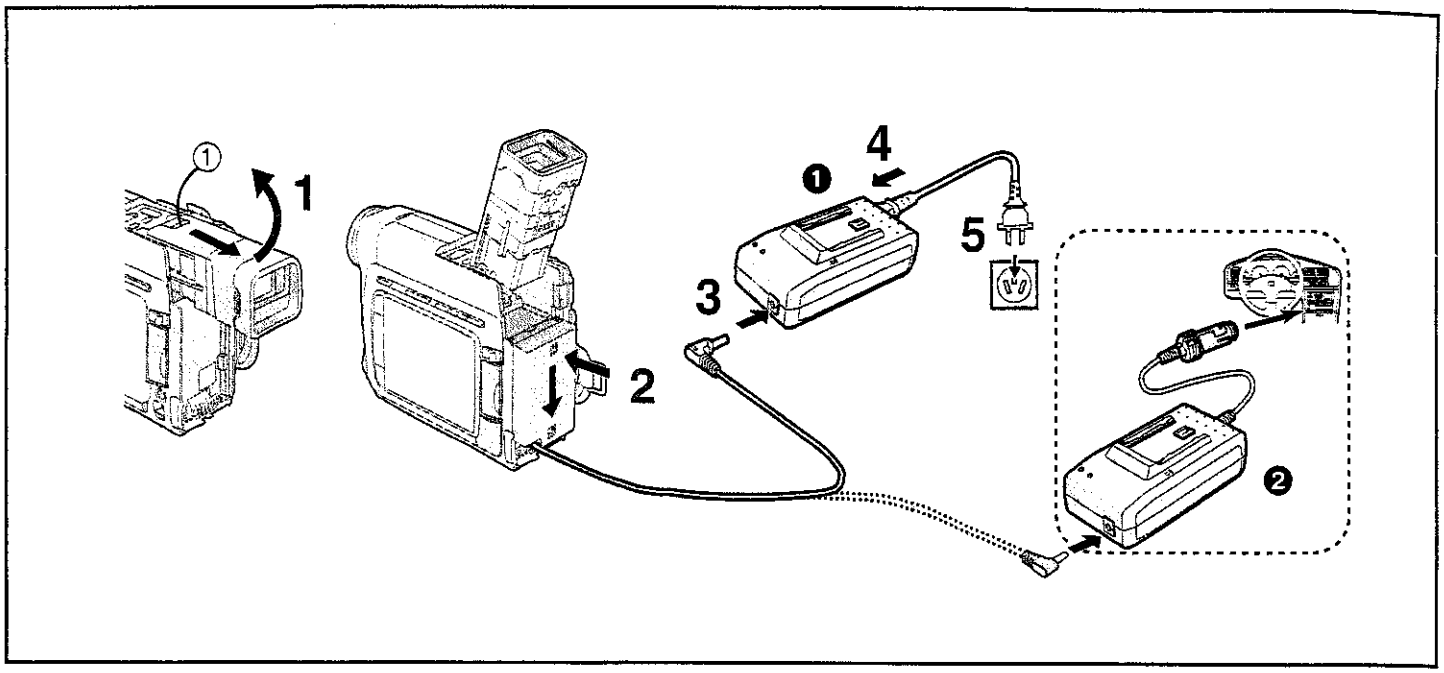
43 Multi Terminal (➜ 29, 30, 78)

44 Tripod Receptacle
To mount the Movie Camera on an optional tripod.

45 Cassette Holder (➜ 11)

46 Lens Cap (➜ 14, 30, 49)

47 Lens Cap Holder



The 3 Types of Power Supplies

1) AC Adaptor ❶ (supplied) to supply power from an AC mains socket
2) Car Battery Charger ❷ (optional) to supply power from the cigarette lighter socket in a vehide
3) Battery (supplied) **(➔ 11)**

■ Supplying Power from an AC Mains Socket

1 **Hook your finger on the protruding edge ① of the Finder, slide the Finder backward to its fully extended position and then tilt it upward.**
Do not pull on the Eyecup to extend the Finder.

2 **Insert the battery-shaped connector of the DC Input Lead as shown above into the Battery Holder on the Movie Camera and slide it downward until it locks with a click.**

3 **Connect the other end of the DC Input Lead to the AC Adaptor.**

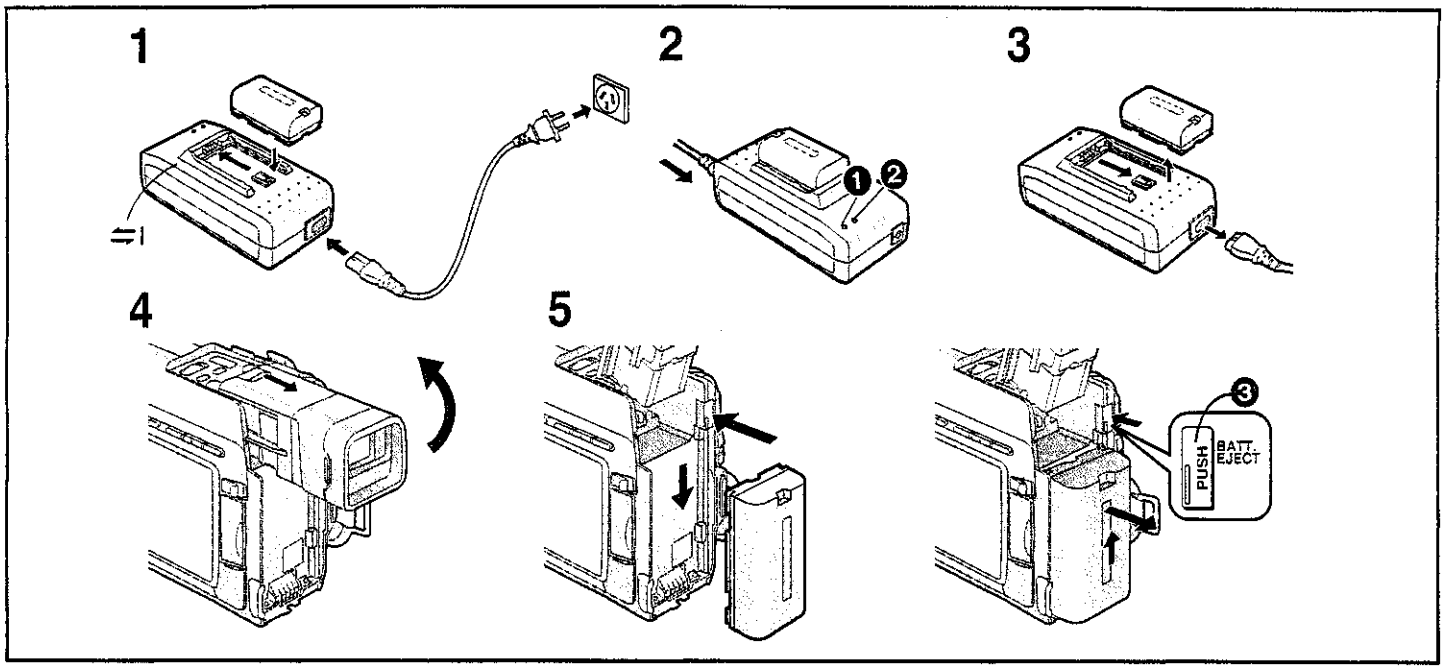
4 **Connect the AC Mains Lead to the AC Adaptor.**

5 **Connect the other end of the AC Mains Lead to an AC mains socket.**
- Before disconnecting the AC Mains Lead, set the [OFF/ON/MODE] Switch on the Movie Camera to [OFF].
- If you use the Movie Camera for a long time, it becomes warm. However, this is normal.

■ Using the Car Battery Charger as Power Source for the Movie Camera

The use of the Car Battery Charger (VW-KBD2E; optional) makes it possible to supply power to the Movie Camera in a car for recording and playback.
It also allows charging the Movie Camera's Battery.

- **After use, be sure to disconnect the Car Battery Charger from the cigarette lighter socket.**
- If the Car Battery Charger is already connected to the cigarette lighter socket when you start the engine, the fuse in the Car Battery Charger's plug may blow out.
- Also read the operating instructions of the Car Battery Charger.



■ Supplying Power with the Battery

Before use, fully charge the Battery.

1 Place the Battery on the AC Adaptor as shown above and slide it horizontally until it stops.

- If the DC Input Lead is connected to the AC Adaptor, disconnect it as charging is not possible otherwise.

2 Securely connect the AC Mains Lead to the AC Adaptor and an AC mains socket.

- The [POWER] Lamp ❶ lights and then the [CHARGE] Lamp ❷ flashes for a few seconds before it remains lit and charging starts.
- If the [CHARGE] Lamp does not flash even though the Battery is attached, remove the Battery and then re-attach it.
- When the [CHARGE] Lamp goes out, charging is finished.

3 Remove the Battery by sliding it in the opposite direction of Step 1 above.

- Also disconnect the AC Mains Lead.

4 Slide the Finder backward to its fully extended position and then tilt it upward.

5 Insert the Battery into the Battery Holder on the Movie Camera and slide it downward until it locks with a click.

Removing the Battery from the Movie Camera

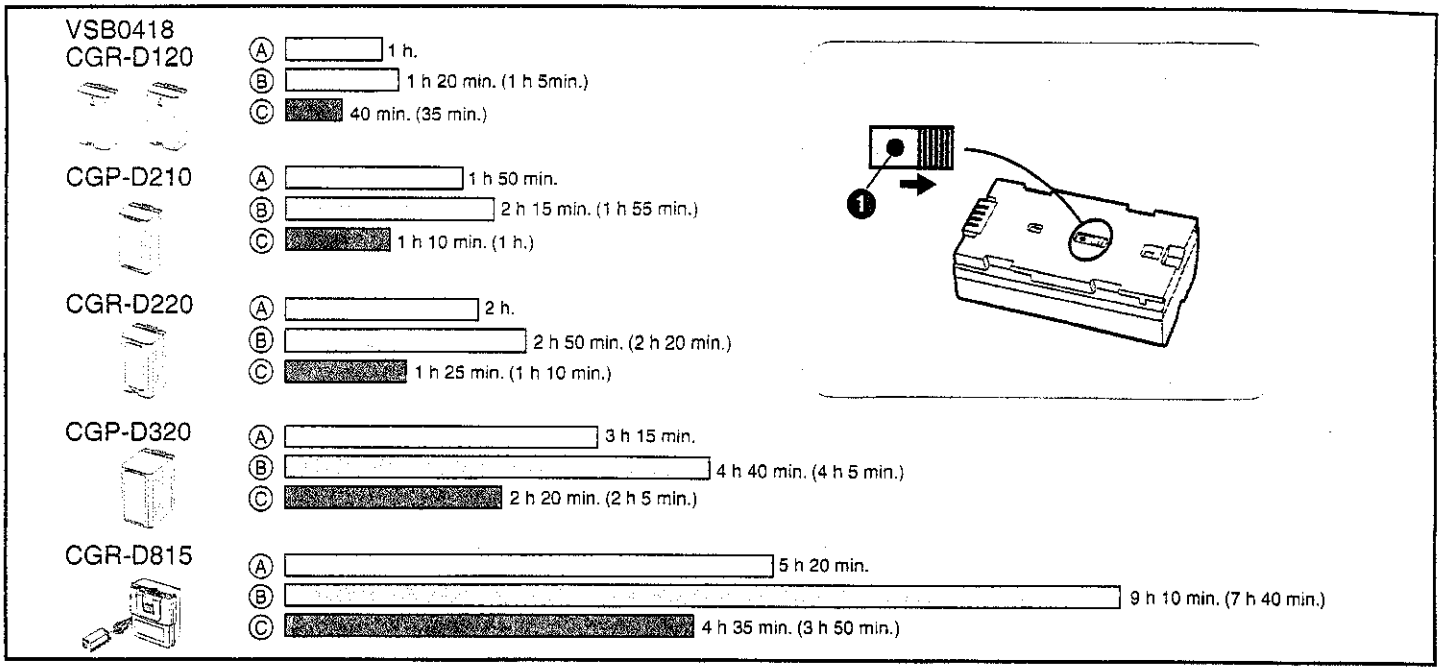
While pressing the [BATT. EJECT PUSH] Button ❸, slide the Battery upward to remove it.

- Be careful not to drop the Battery by accident.
- Before removing the Battery, set the [OFF/ON/MODE] Switch to [OFF].

■ Charging Lamp [CHARGE]

Flashing:	During checking of the Battery condition
Lit:	During charging
Off:	The Battery is fully charged

- If you charge the Battery when it is not yet discharged, the [CHARGE] Lamp may flash briefly and then go out. This indicates that the Battery is fully charged. Therefore, this is not an indication of a malfunction.


VSB0418
CGR-D120
Ⓐ 1 h.
Ⓑ 1 h 20 min. (1 h 5min.)
Ⓒ 40 min. (35 min.)
CGP-D210
Ⓐ 1 h 50 min.
Ⓑ 2 h 15 min. (1 h 55 min.)
Ⓒ 1 h 10 min. (1 h.)
CGR-D220
Ⓐ 2 h.
Ⓑ 2 h 50 min. (2 h 20 min.)
Ⓒ 1 h 25 min. (1 h 10 min.)
CGP-D320
Ⓐ 3 h 15 min.
Ⓑ 4 h 40 min. (4 h 5 min.)
Ⓒ 2 h 20 min. (2 h 5 min.)
CGR-D815
Ⓐ 5 h 20 min.
Ⓑ 9 h 10 min. (7 h 40 min.)
Ⓒ 4 h 35 min. (3 h 50 min.)
1

Charging Time and Maximum Time for Continuous Recording

Ⓐ **Charging Time**
Ⓑ **Maximum Continuous Recording Time**
Ⓒ **Intermittent Recording Time**
(The Intermittent Recording Time indicates the total recording time possible when you start and stop recording repeatedly.)

- **"1 h 10 min." stands for "1 hour and 10 minutes".**
- The Battery Model VSB0418 is supplied.
- The times shown in the above chart are approximations. The figures in parentheses show the recording time when using the LCD Monitor.

The times listed above for your information indicate the duration of recording performed at an ambient temperature of 20°C and 60% relative humidity. The charging time may be longer when you charge the Battery at higher or lower temperature.

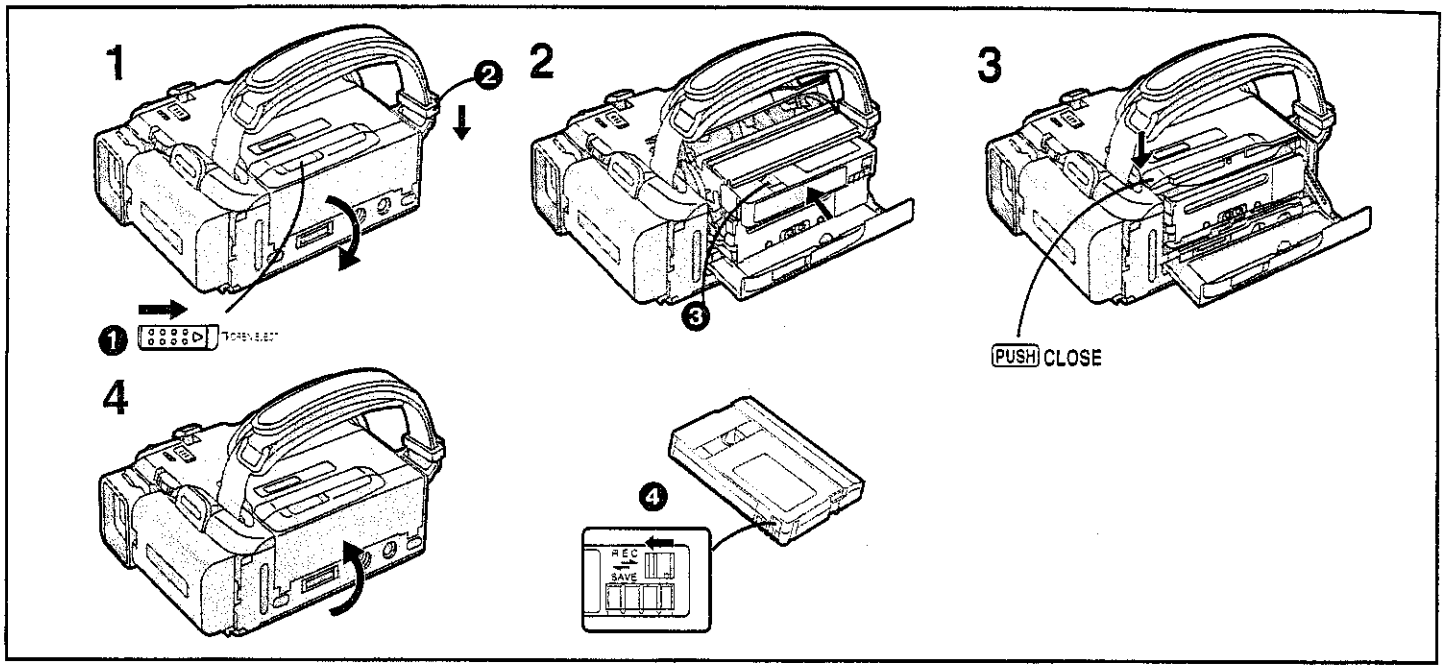
- During use and charging, the Battery becomes warm. The Movie Camera, too, becomes warm during use.
- When you repeatedly stop and restart recording, the recording time per Battery is shorter than listed above.
- If you do not use the Battery for a long time, please read "Precautions for Storage" **(➔ 106)**.
- **The Battery models CGP-D110 and CGP-D105 cannot be charged with this AC Adaptor.**

When the [CHARGE] Lamp Flashes Continuously

If the temperature of the Battery is extremely low or extremely high, the [CHARGE] Lamp on the AC Adaptor flashes continuously. It also flashes continuously when some malfunction has occurred in the Battery or the AC Adaptor. For details, read "Notes about the AC Adaptor" **(➔ 102)**.

Using Optional Batteries Equipped with Charge Confirmation Marker

You can use this marker to easily distinguish between charged and discharged Batteries.
For example, slide the knob so that the red dot (●) ❶ is visible after the charging is completed. (The Supplied Battery VSB0418 is not equipped with a Charge Confirmation Marker.)



Inserting the Cassette

1 **Slide the [OPEN/EJECT] Lever ❶ to the right until it locks with a click and simultaneously open the Lower Cassette Compartment Cover completely.**
The Cassette Holder slides out.

2 **Insert the cassette with its window in position ❸ shown above.**

3 **Press on the [PUSH CLOSE] mark to close the Upper Cassette Compartment Cover.**
The Cassette Holder with the cassette slides back inside. Confirm that the Cassette Holder has retracted completely.

4 **Close the Lower Cassette Compartment Cover.**

- If the AC Adaptor or Battery is used to supply power, it is possible to insert or eject the cassette without turning on the Movie Camera.
- When opening or closing the Cassette Compartment, push down the buckle ❷ of the Grip Belt in the direction of the arrow so it does not obstruct the opening and closing of the Cassette Compartment.
- When inserting the cassette, make sure it faces in the right direction and then push it in until it stops.
- When you insert a cassette onto which you have recorded before, use the Camera Search Function (➔ 31) to search for the position from which you want to continue recording.
- When you insert a new cassette, rewind the tape to the beginning before starting to record.

Preventing Accidental Erasure of Recordings
Opening the cassette's erasure prevention slider ❹ (sliding it in the direction of the [SAVE] arrow) prevents recording. To record again, close the erasure prevention slider (slide it in the direction of the [REC] arrow).

If the Cassette Holder Does Not Slide Back inside

- Press on the [PUSH CLOSE] mark and close the Upper Cassette Compartment Cover securely.
- Turn the Movie Camera off and then on again.
- Check if the Battery is discharged.

If the Cassette Holder Does Not Slide Out

- Close the Lower Cassette Compartment Cover completely and then open it again.
- Check if the Battery is discharged.

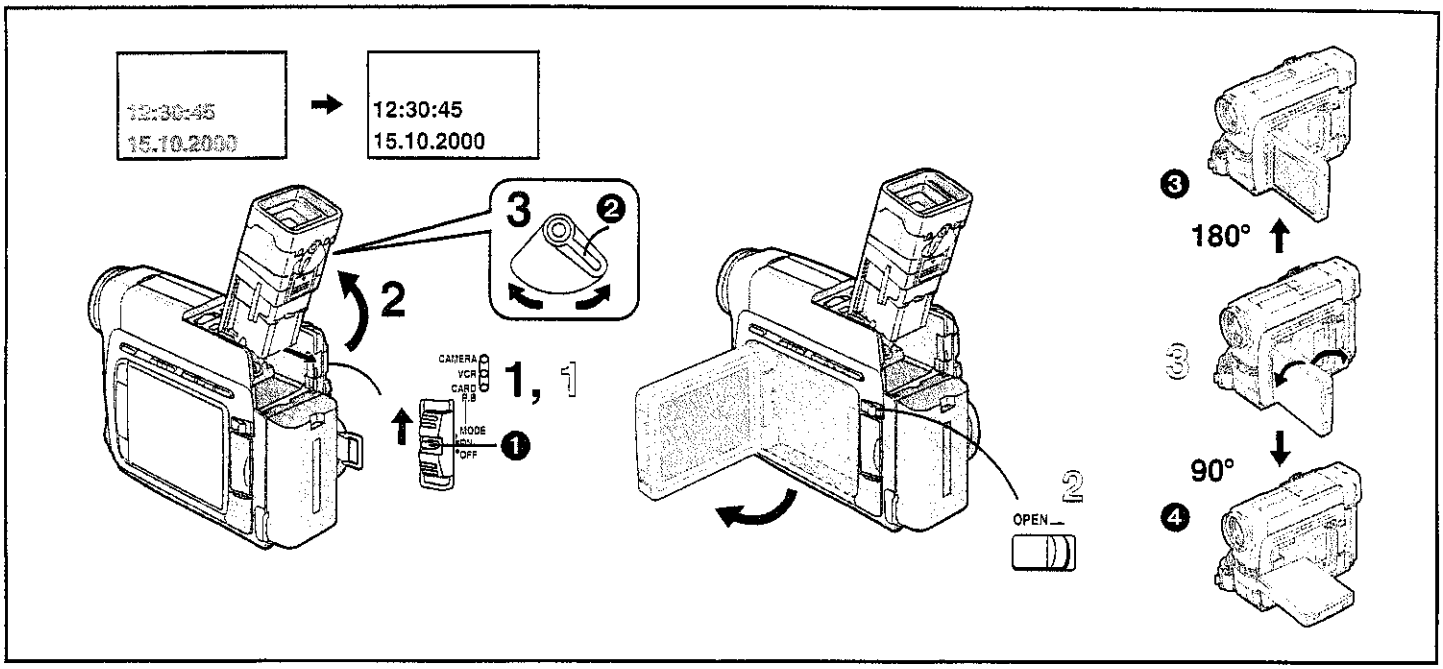
■ LP Mode

The desired recording speed can be selected with [REC SPEED] on the [OTHER FUNCTIONS] Sub-Menu.

If you select the LP Mode, the possible recording time is 1.5 times as long as in the SP Mode.

Recording in the LP mode does not deteriorate the picture quality. However, the playback picture may contain mosaic-like patterns and certain functions may be restricted.

- In the following cases, mosaic-like patterns may appear in the playback picture, or the picture may not be played back correctly:
  - When a cassette recorded in the LP Mode on this Movie Camera is played back on other digital video equipment.
  - When a cassette recorded in the LP Mode on other digital video equipment is played back on this Movie Camera.
  - When a cassette recorded in the LP Mode on this Movie Camera is played back on digital video equipment not featuring the LP Mode.
  - In the Slow Motion or Still Advance Playback Mode. **(➔ 27, 28)**
  - When using the Camera Search Function. **(➔ 31)**
- As the recording track width in the LP Mode is smaller than the head width, recording new sound onto an already recorded cassette (audio dubbing) **(➔ 61)** is not possible.



Using the Finder

Before using the Finder, adjust it to your eyesight so that the indications in the Finder are clear and easy to read.

1 Set the [OFF/ON/MODE] Switch to [ON].
While pressing the centre button ❶, slide the switch so that the corresponding Lamp lights.

2 Slide the Finder backward to its fully extended position and then tilt it upward.

3 Adjust by turning the Eyepiece Corrector Lever ❷.

Note:
Do not leave the Finder exposed to direct sunlight, as its magnifying glass could bundle the light beams and seriously heat-damage the Finder.

Using the LCD Monitor

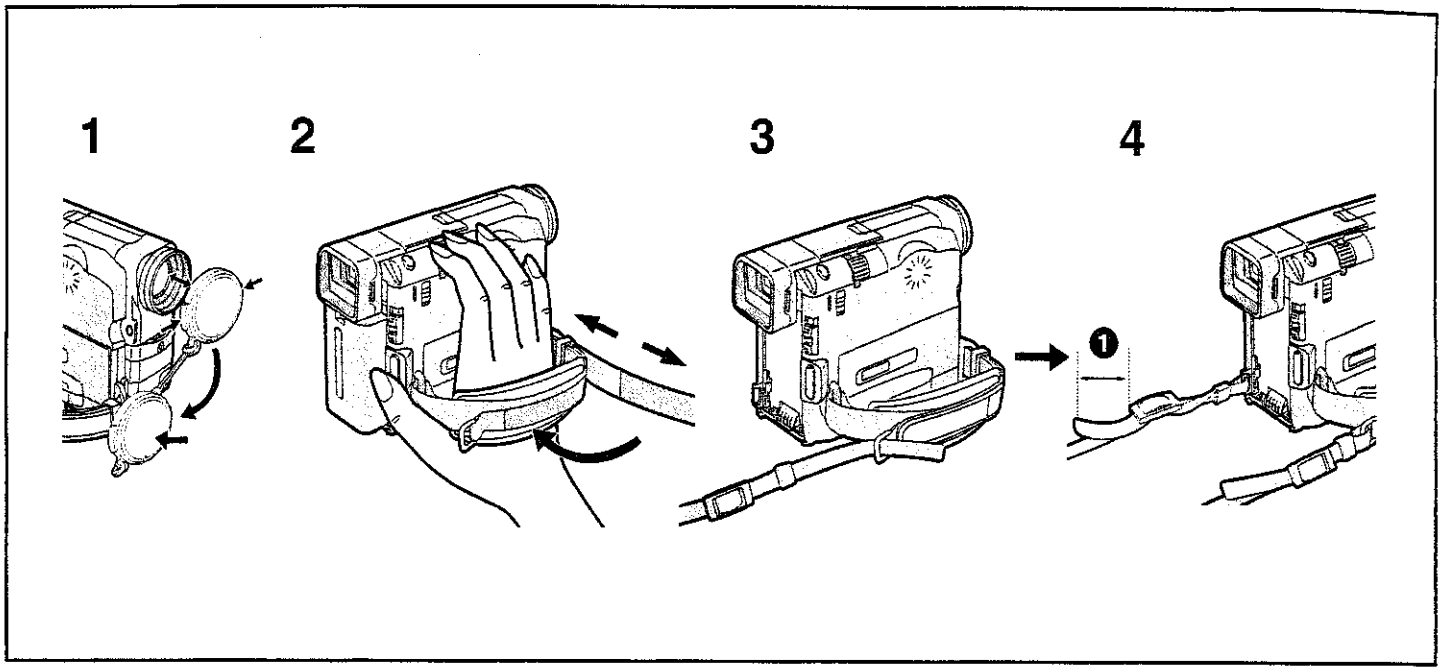
You can also record while viewing the picture on the opened LCD Monitor.

1 **Set the [OFF/ON/MODE] Switch to [ON].**
While pressing the centre button ❶, slide the switch so that the corresponding Lamp lights.

2 **Slide the [OPEN] Lever and turn out the LCD Monitor by approximately 90° in the direction of the arrow.**
The Finder turns off.

3 **Adjust the angle of the LCD Monitor according to the recording angle.**
- The LCD Monitor rotates upward a maximum of 180° ❸ and downward by a maximum of 90° ❹ from its normal vertical position. Trying to forcefully rotate it beyond this range could seriously damage the Movie Camera.

Closing the LCD Monitor
Push the LCD Monitor close until it locks with a click.



Handling the Lens Cap

Before you start recording, remove the Lens Cap.

1 **You can attach the removed Lens Cap to the Grip Belt.**
When not actually recording, always attach the Lens Cap to the Lens to protect it.

Note:
Do not leave the Lens exposed to direct sunlight, as it could bundle the light beams and seriously heat-damage the CCD-Sensor.

Adjusting the Grip Belt

You can adjust the Grip Belt to the size of your hand.

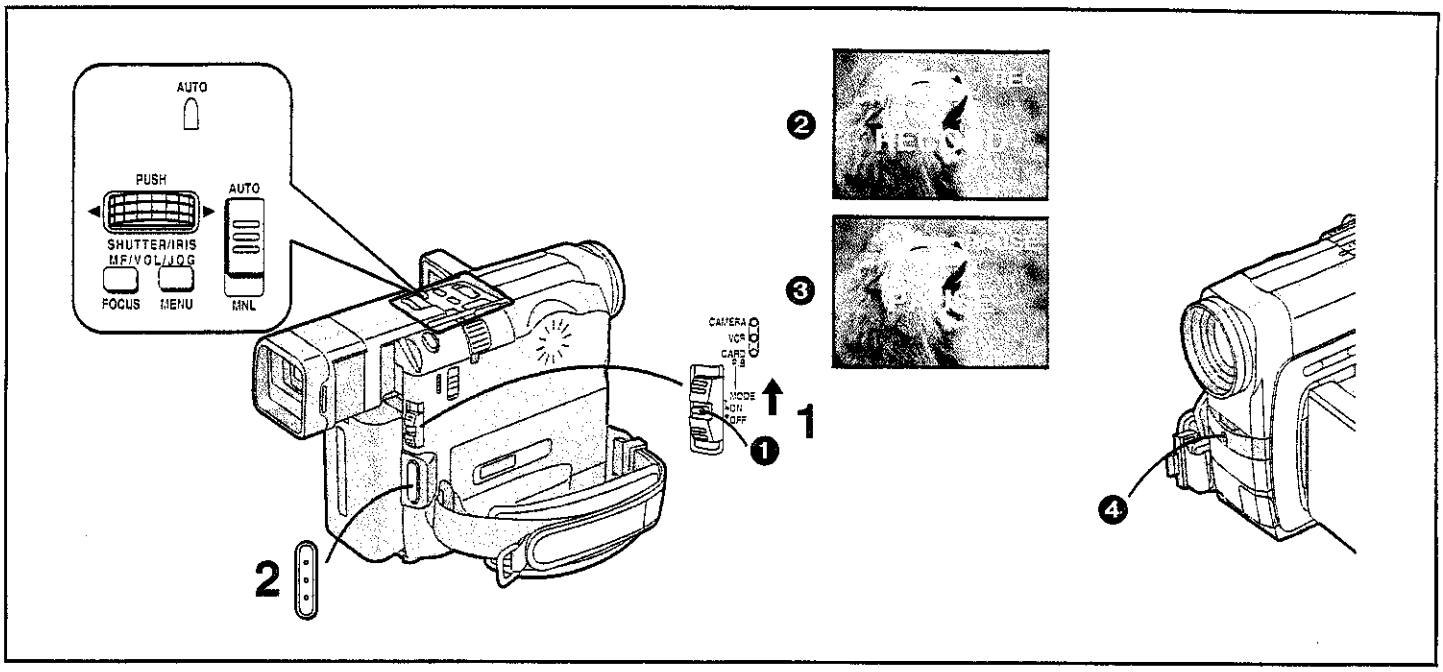
2 **Pass your hand through the Grip Belt and adjust its length. Fold back the end of the Grip Belt to securely fasten the velcro tape closure.**
When you open or close the Cassette Compartment, push down the buckle of the Grip Belt so that it does not prevent the Cassette Compartment from opening and closing completely.

Attaching the Shoulder Strap

Before you go recording outside, we recommend that you attach the Shoulder Strap to prevent the Movie Camera from dropping accidentally.

3 **Pull the end of the Shoulder Strap through the Shoulder Strap Holder on the Movie Camera.**

4 **Fold the end of the Shoulder Strap back, pull it first through the loop and then the Shoulder Strap Length Adjuster.**
Pull it out more than 2 cm ❶ from the Shoulder Strap Length Adjuster so that it cannot slip off.



Recording

After setting the [OFF/ON/MODE] Switch to [ON] to turn the Movie Camera on and setting the Mode Selector Switch to [AUTO], you can start recording simply by pressing the Recording Start/Stop Button. In this case, the Movie Camera adjusts the focus and white balance fully automatically.

1 **Set the [OFF/ON/MODE] Switch to [ON].**
While pressing the centre button ❶, slide the switch so that [CAMERA] Lamp lights.

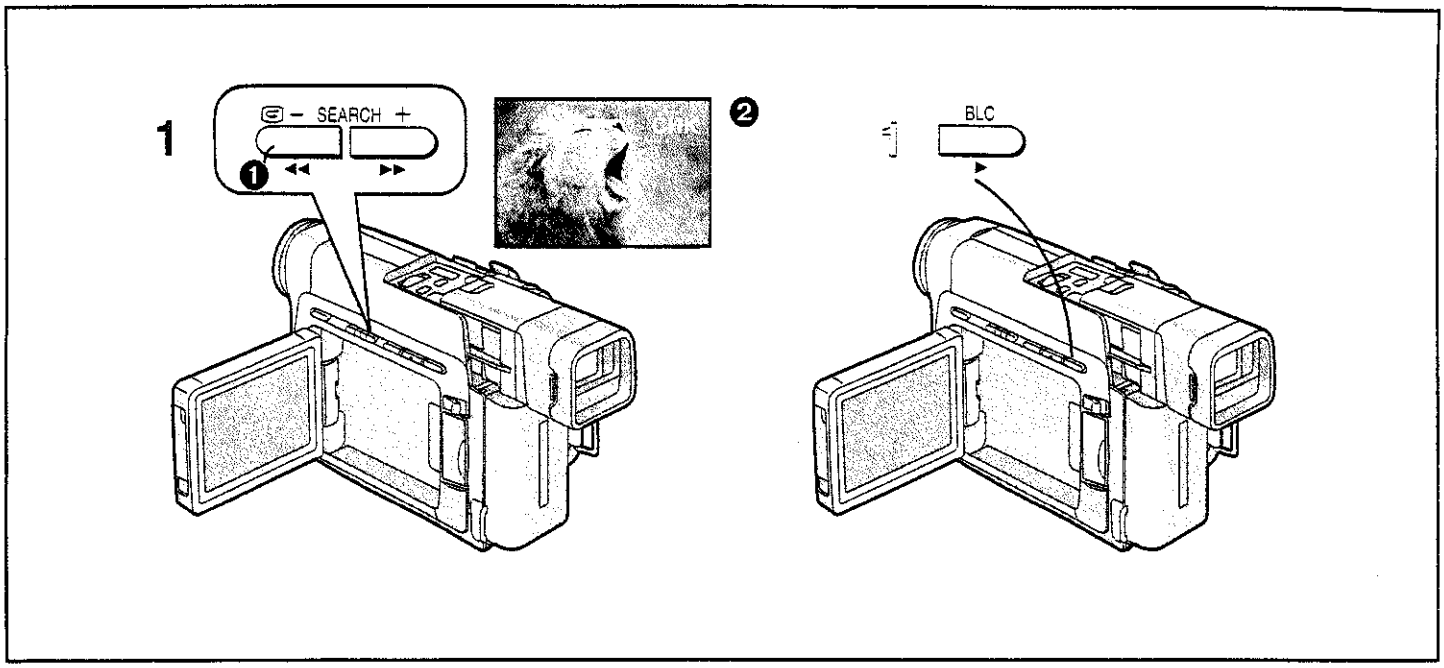
2 **Press the Recording Start/Stop Button.**
Recording starts. The [RECORD] Indication appears briefly and then changes to [REC] ❷.

To pause recording:
Press the Recording Start/Stop Button again.
The [PAUSE] Indication appears ❸.

To finish recording:
Set the [OFF/ON/MODE] Switch to [OFF].
It is not necessary to press the centre button in order to slide the switch to [OFF].

- Depending on the light source and recording situation, correct automatic focusing and white balance adjustment may not be possible. In such cases, adjust them manually. Focus: **(➔ 50)**; White Balance: **(➔ 48, 49)**
- Be sure to remove the Lens Cap before setting the [OFF/ON/MODE] Switch to [ON]. If the Lens Cap is still attached to the Lens when the [CAMERA] Lamp lights, the automatic white balance adjustment **(➔ 111)** may not be precise.
- **If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. To resume recording from this condition, set the [OFF/ON/MODE] Switch to [OFF] and then to [ON] again.**

Recording Lamp (Tally Lamp)
The Recording Lamp lights ❹ during recording to let the people in front of the Movie Camera know that recording is being performed. If you set [REC LAMP] on the [OTHER FUNCTIONS] Sub-Menu to [OFF], the Recording Lamp does not light.



Checking If the Picture Is Recorded
(Recording Check)

To play back the final few seconds of the last recorded scene in the Recording Pause Mode.

1 Press the Recording Check Button [⟲] ❶ briefly in the Recording Pause Mode.
The [CHK] Indication ❷ appears.
After checking, the Movie Camera returns to the Recording Pause Mode.

- For Recording Check, the Movie Camera must be in the same mode (SP or LP) as used for recording, otherwise the playback picture is distorted.

Recording Backlit Scenes
(Backlight Compensation)

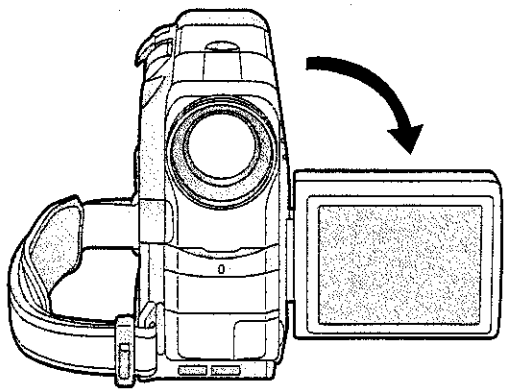
To prevent the backlit subject from being recorded very dark. (Backlight means that the light falls on the subject from behind, i.e. the subject is between the light source and the Movie Camera.)

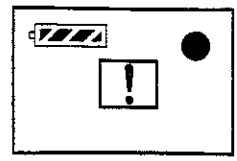
Keep the Backlight Button [BLC] pressed.

The backlight is being compensated as long as you keep the Button pressed, and the subject is recorded more brightly. (The picture brightens up as a whole.)

Returning to Normal Recording
Release the Backlight Button [BLC].

1





Recording Yourself

(Recording with the LCD Monitor Facing Forward)

This makes it possible to record yourself while viewing the picture on the LCD Monitor or to show the persons in front of the Movie Camera the picture being recorded.

1 Open the LCD Monitor and turn it so that it faces forward (lens side).

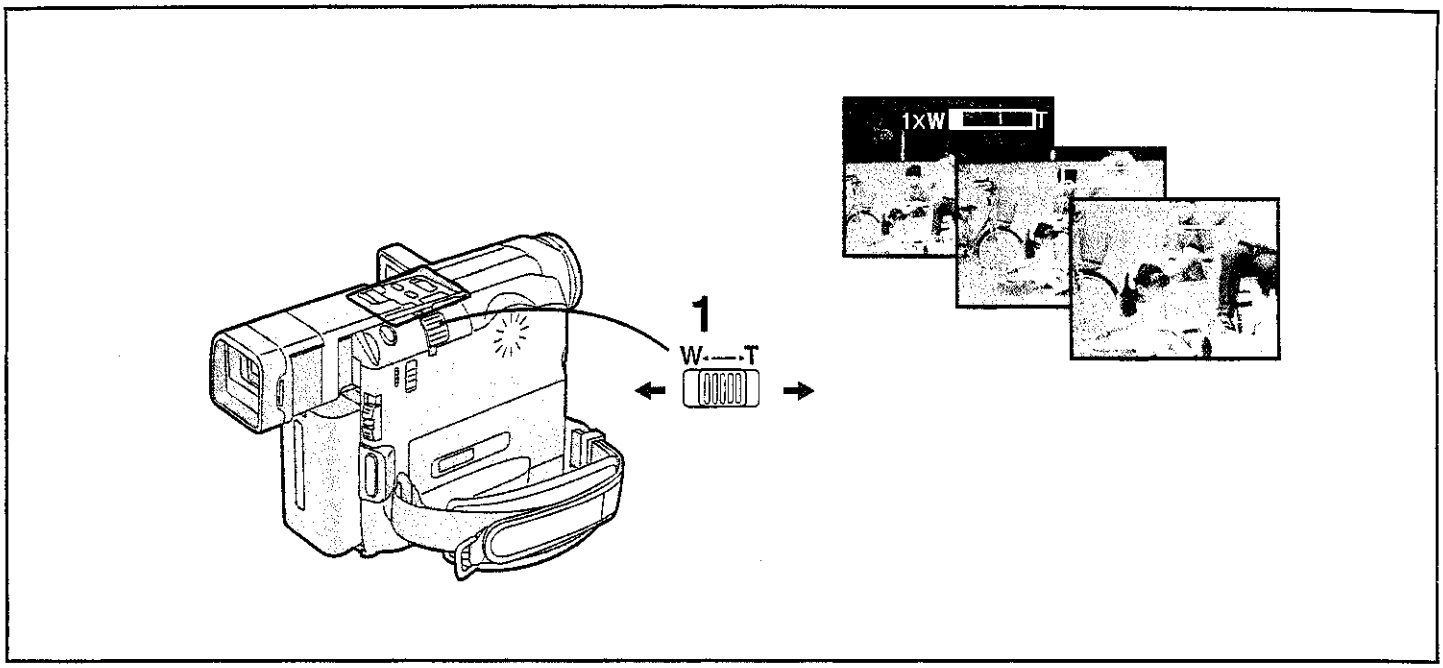
Opening the LCD Monitor automatically turns off the Finder. However, when you turn the LCD Monitor forward, the picture also appears in the Finder.
This lets you aim the Movie Camera and view the picture in the Finder, while the persons in front of the Movie Camera can check the picture on the LCD Monitor during recording.

Mirror Mode for the Picture on the LCD Monitor

You are used to looking at yourself in the mirror. Therefore, when recording yourself with the LCD Monitor facing forward, the picture (as it is being recorded) might look unusual and distracting. If you prefer to see yourself on the LCD Monitor in the same way as you see yourself in a mirror, i.e. with the sides reversed, set [SELFSHOOT] on the [DISPLAY SETUP] Sub-Menu to [MIRROR]. However, the picture will still be recorded in the normal, non-reversed way.
This Mirror Mode for the picture on the LCD Monitor works only during recording and in the Recording Pause Mode with the LCD Monitor facing forward. Also, it is completely different from the Mirror Mode of the Digital Effects 1 **(➔ 39)**.

- In the Mirror Mode, only the following indications are displayed.
  - ● : Recording
  - ●II : Recording Pause
  - : Remaining Battery Power

When the General Warning/Alarm Indication [!] appears, turn the LCD Monitor backward so that you can confirm the actual Warning/Alarm Indication.



Enlarging Your Subject or Widening the Recording Angle (Zooming In/Out)

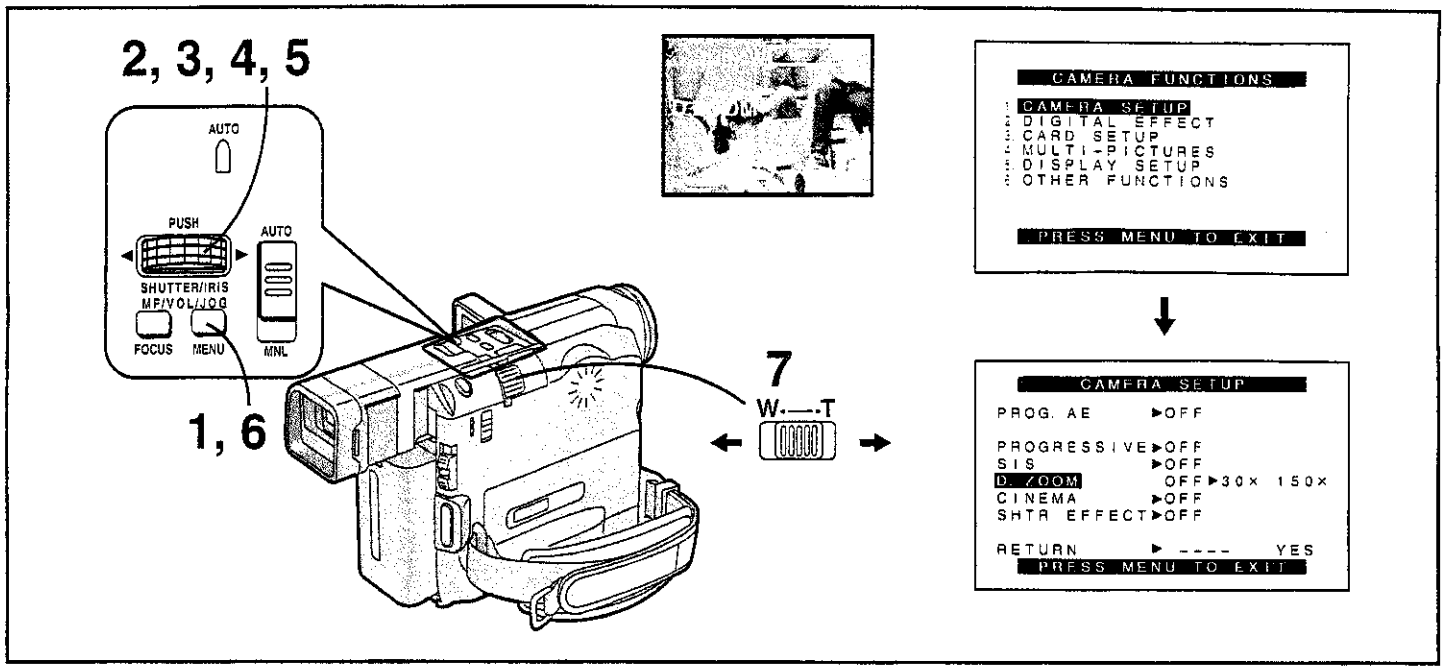
Recording close-ups of your subjects and recording wide-angle shots add special effects to your videos.

1 To record a wider view (Zooming-out): Push the [W/T] Zoom Lever toward [W]. To enlarge your subject (Zooming-in): Push the [W/T] Zoom Lever toward [T].

- The Zoom Magnification Indication appears for a few seconds.
- As a general rule, the further you push the [W/T] Zoom Lever toward [W] or [T], the faster the zooming speed.
- In the Recording Pause Mode, if you push the [W/T] Zoom Lever toward [W] or [T] until you feel a click, you can zoom between 1× and 15× in an extremely fast 0.5 second. **(Jet Zoom)**
- During recording, zooming between 1× and 15× is possible in as short a time as approximately 1.0 second. However, even if you push the [W/T] Zoom Lever until you feel a click, it is not possible to zoom faster than in 1.0 second. Therefore, we do not recommend that you push the [W/T] Zoom Lever all the way until you feel a click, as a click sound could be recorded in this case.
- During very fast zooming, the picture may temporarily go out of focus.
- When you have zoomed to the tele setting, precise focusing is only possible on subjects no closer than 1.2 metres.

Recording Extra Close-up Shots of Small Subjects (Macro Close-up Function)

When the zoom magnification is 1×, the Movie Camera can focus on subjects down to a distance of approximately 35 mm between lens and subject. This allows recording very small subjects such as insects.



Enlarging Your Subjects Even More

(Digital Zooming)

This function is convenient when you want to enlarge a very distant subject even more than is possible with the normal (optical) zoom which offers a magnification range of 1×–15×. For the Digital Zoom Function, you can choose between up to 30× and up to 150× magnification.

1 **Press the [MENU] Button.**
The [CAMERA FUNCTIONS] Main-Menu appears.

2 **Turn the [PUSH] Dial to select [CAMERA SETUP].**

3 **Press the [PUSH] Dial.**
The [CAMERA SETUP] Sub-Menu appears.

4 **Turn the [PUSH] Dial to select [D.ZOOM].**

5 **Press the [PUSH] Dial to select [30×] or [150×].**

- **30×:** Digital zooming up to 30×.
- **150×:** Digital zooming up to 150×.
- If [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON], it is not possible to select either of these settings.

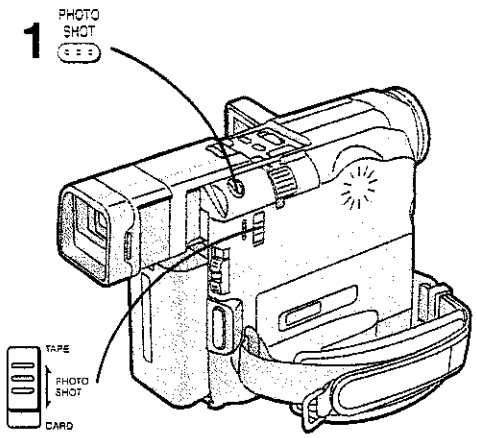
6 **Press the [MENU] Button to exit the menu.**

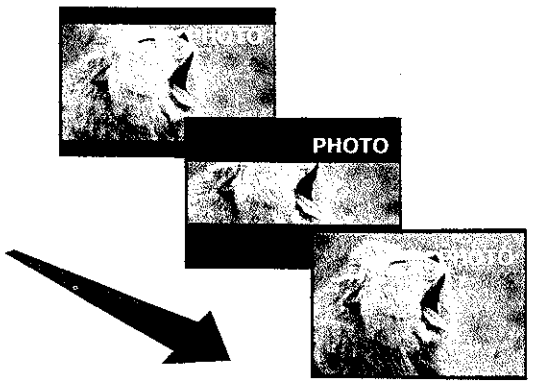
7 **Push the [W/T] Zoom Lever toward [W] or [T] to zoom in or out on the subject.**

- The higher the Digital Zoom Magnification is, the lower is the picture quality.

Cancelling the Digital Zoom Function
Set [D.ZOOM] on the [CAMERA SETUP] Sub-Menu to [OFF].

- If you zoom to 15× or higher (digital zoom range) when [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [AUTO], the Progressive Photoshot Mode is automatically cancelled.
- When you have zoomed to 15× or higher (digital zoom range), manually adjusting the white balance or selecting any of the preset white balance modes is not possible.





Recording Still Pictures on the Cassette (Photoshot)

With this function, you can record still pictures with sound for approximately 7 seconds each.

1 Press the [PHOTO SHOT] Button in the Recording Pause Mode.

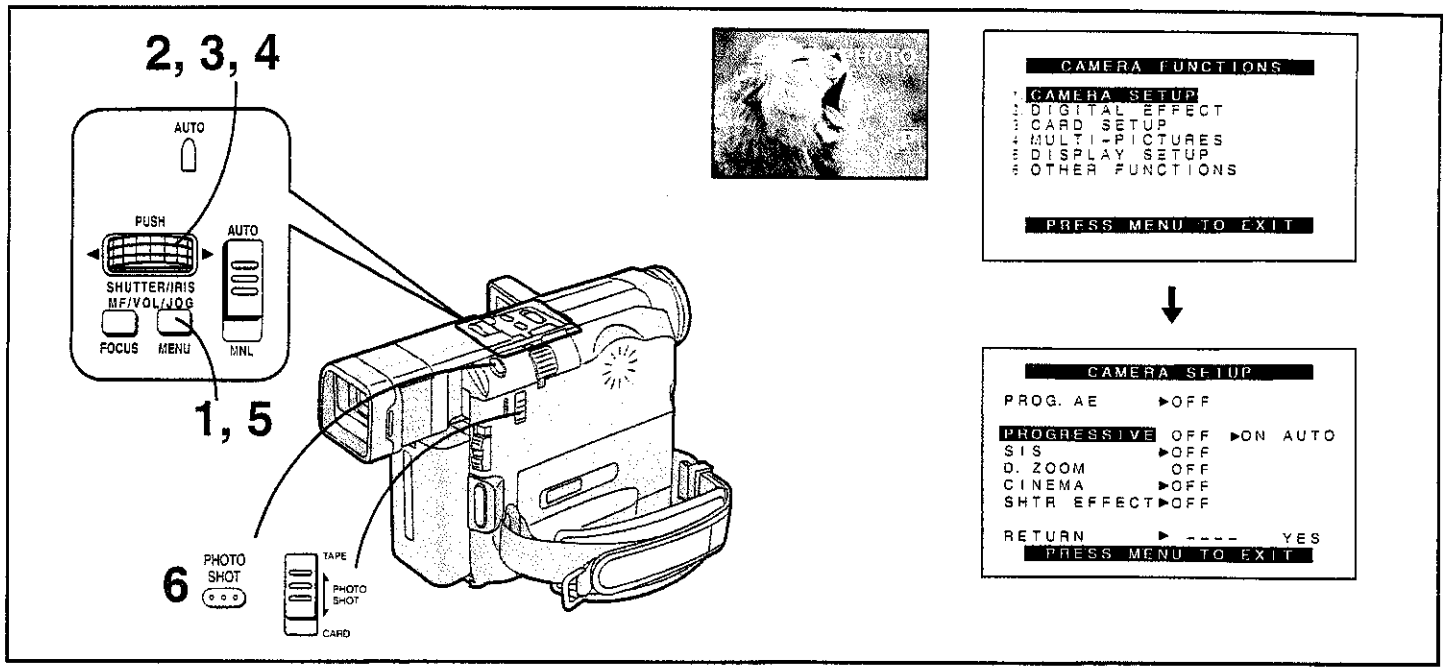
The Movie Camera records a still picture for approximately 7 seconds and then switches back to the Recording Pause Mode.

- It is not possible to use the Photoshot Function during a normal recording.
- If you set [SHTR EFFECT] on the [CAMERA SETUP] Sub-Menu to [ON], the screen blinks briefly and a simulated shutter click sound can be heard when you press the [PHOTO SHOT] Button. This audiovisual effect is also recorded.
- With the still pictures that you have recorded in the Photoshot Mode, you can do the following:
  - Index Search **(➔ 33, 34)**
    (However, searching for the picture(s) recorded at the beginning of the tape may not be possible.)
  - Automatic printing **(➔ 83)**
- The visual shutter effect and click sound may occur with slight delay after recording of the still picture has started.
- The picture quality deteriorates slightly.

Continuous Photoshot

If you set [SHTR EFFECT] on the [CAMERA SETUP] Sub-Menu to [ON] and keep the [PHOTO SHOT] Button pressed in the Recording Pause Mode, the Movie Camera automatically records still pictures successively at intervals of approximately 0.7 seconds until you release the button.

- One more still picture may be recorded after you release the [PHOTO SHOT] Button.
- As the still pictures recorded in the Continuous Photoshot Mode are not marked with photoshot index signals, they cannot be located by using the Photoshot Index Search Function and printed with the Auto Print Function.
- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON] or [AUTO], the Continuous Photoshot Function cannot be used.



Recording Still Pictures on the Cassette (Continued)

■ Progressive Photoshot

The Progressive Photoshot Function lets you record still pictures with higher resolution than the normal Photoshot Function. This is ideal for example for pictures that you want to print with a Digital Video Printer or import into a computer.

1 **Press the [MENU] Button.**
The [CAMERA FUNCTIONS] Main-Menu appears.

2 **Turn the [PUSH] Dial to select [CAMERA SETUP] and then press the [PUSH] Dial.**
The [CAMERA SETUP] Sub-Menu appears.

3 **Turn the [PUSH] Dial to select [PROGRESSIVE].**

4 **Press the [PUSH] Dial to select [ON] or [AUTO].**

5 **Press the [MENU] Button to exit the menu.**
The [P] Indication appears.

6 **Press the [PHOTO SHOT] Button in the Recording Pause Mode.**
The Movie Camera records a still picture for approximately 7 seconds and then switches back to the Recording Pause Mode.

- With this function, you can take still pictures that are recorded as frames with higher resolution. However, this Frame Mode cannot be used for normal recording of motion pictures.
- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON] or [AUTO], the Continuous Photoshot Function cannot be used.
- When you press the [PHOTO SHOT] Button, the Movie Camera emits a click sound. However, this is normal and not a malfunction.

Notes about the Settings for [PROGRESSIVE]

When the [P] Indication is displayed, you can use the Progressive Photoshot Function.

- When you record a still picture in the Progressive Photoshot Mode while [PROG.AE] on the [CAMERA SETUP] Sub-Menu is set to Sports Mode [ ] **(➔ 37)** or Portrait Mode [ ] **(➔ 37)**, the picture brightness may vary from picture to picture.

When [PROGRESSIVE] Is Set to [ON]:

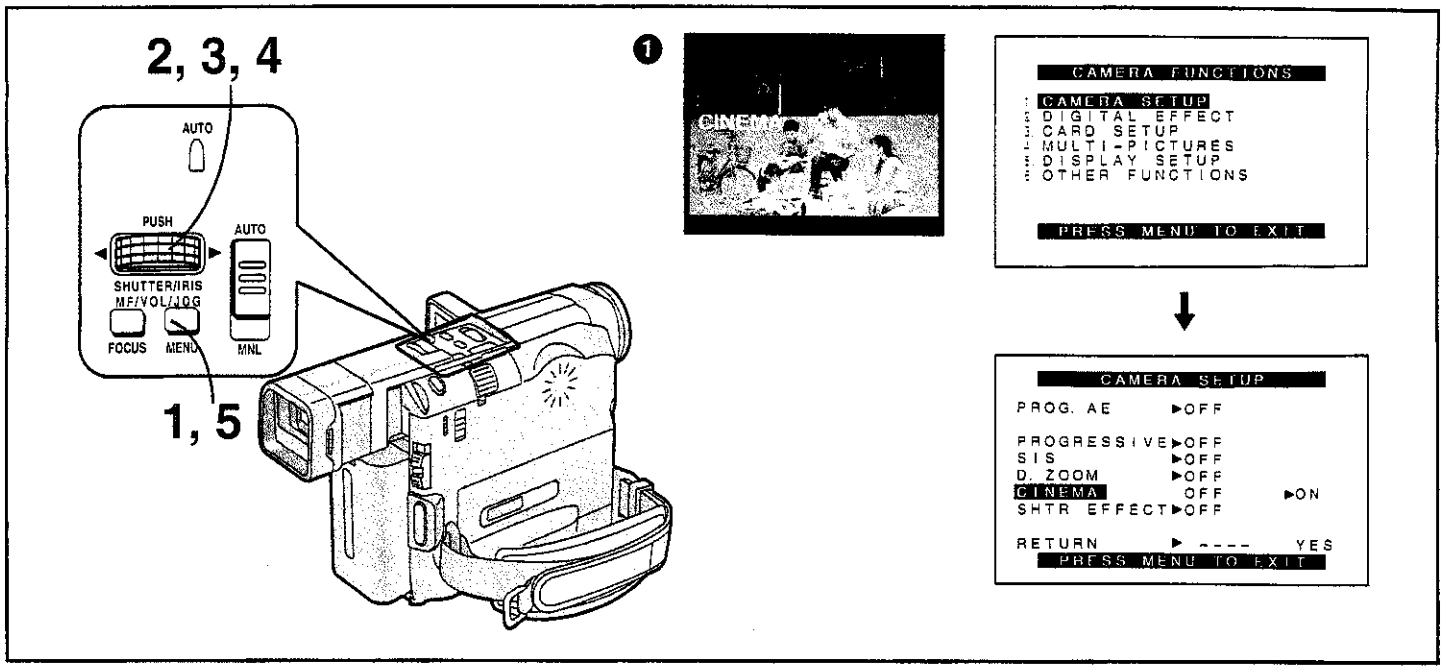
You can always use the Progressive Photoshot Function.
In this case, however, the following functions are deactivated;

- Digital Effect Modes in [EFFECT1] **(➔ 39)**
- Digital Zoom [D.ZOOM] **(➔ 19)**
- Shutter Speeds of 1/750 s and faster **(➔ 51)**

When [PROGRESSIVE] Is Set to [AUTO]:

In the following cases, using the Progressive Photoshot Function is not possible.

- When the zoom magnification is approximately 15× or higher.
- When the shutter speed is 1/750 s or faster.
- When [EFFECT1] is set to [WIPE], [MIX], [STROBE], [GAINUP], [TRACER], [MOSAIC] or [MIRROR].
- When a picture is displayed in the Multi-Picture Mode or in the Picture-in-Picture Mode.



Recording in the Cinema Mode

(Cinema Mode)

This mode lets you record in the cinema-like wide-screen format.

1 **Press the [MENU] Button.**
The [CAMERA FUNCTIONS] Main-Menu appears.

2 **Turn the [PUSH] Dial to select [CAMERA SETUP] and then press the [PUSH] Dial.**
The [CAMERA SETUP] Sub-Menu appears.

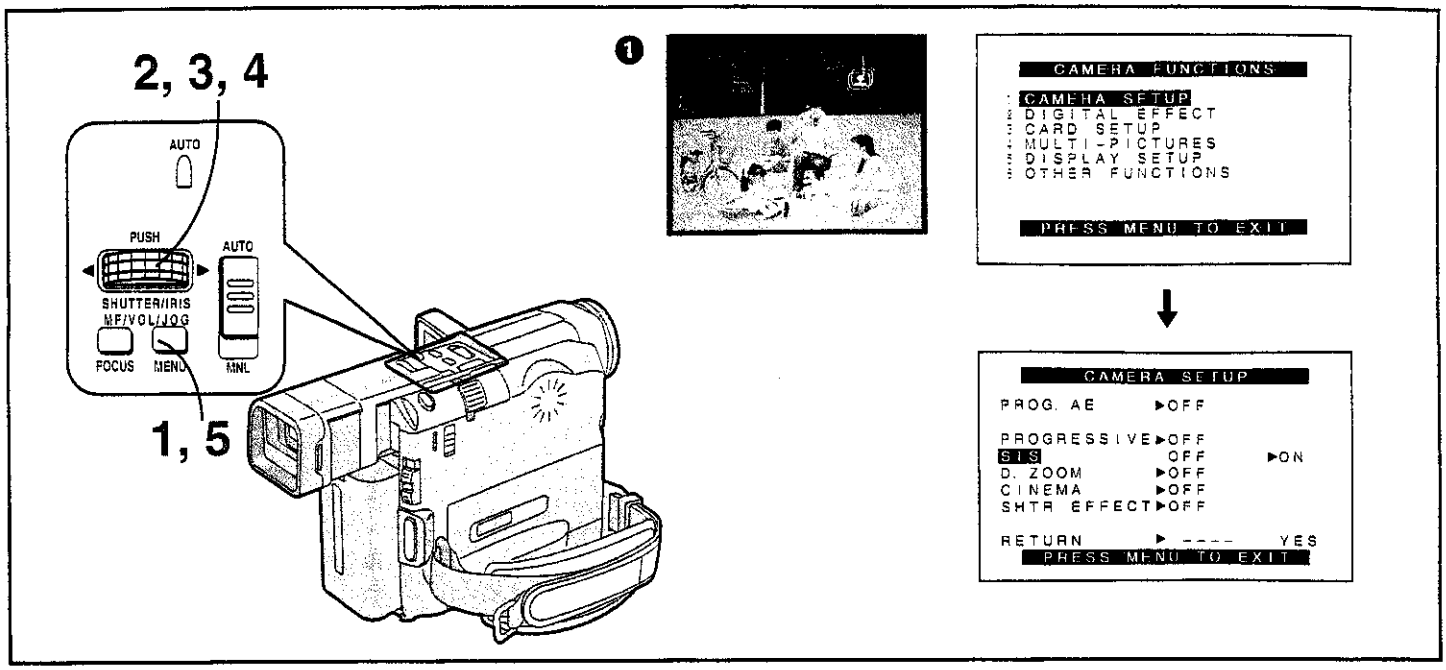
3 **Turn the [PUSH] Dial to select [CINEMA].**

4 **Press the [PUSH] Dial to select [ON].**
Black bars appear at the top and bottom of the screen ❶.

5 **Press the [MENU] Button to exit the menu.**

Cancelling the Cinema Mode
Set [CINEMA] on the [CAMERA SETUP] Sub-Menu to [OFF].

- Using the Cinema Mode does not widen the recording angle.
- A picture displayed in the Multi-Picture Mode cannot be displayed in the Cinema Mode.
- If you play back the picture recorded in the Cinema Mode on a wide-screen (16:9) format TV, the size of the playback picture is automatically adjusted to match the format of the TV screen. For details, read the TV's operating instructions.



Recording with Minimised Camera Shake (Super Image Stabilizer)

In recording situations where shaking of the Movie Camera is likely to happen, for example when you have zoomed in on a distant subject or when you record while walking, you can use this function to stabilize the image.

- In case of very strong camera shake, it may not be possible to stabilize the picture.

1 **Press the [MENU] Button.**
The [CAMERA FUNCTIONS] Main-Menu appears.

2 **Turn the [PUSH] Dial to select [CAMERA SETUP] and then press the [PUSH] Dial.**
The [CAMERA SETUP] Sub-Menu appears.

3 **Turn the [PUSH] Dial to select [SIS].**

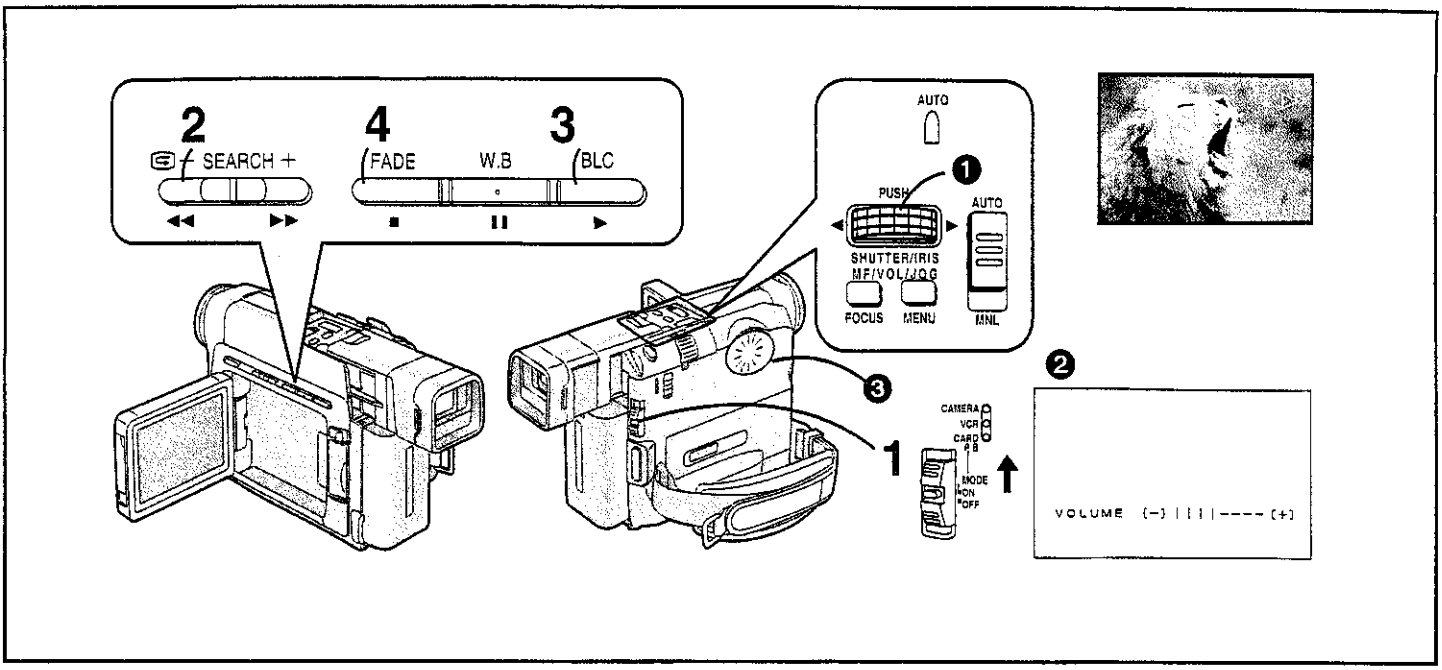
4 **Press the [PUSH] Dial to select [ON].**

5 **Press the [MENU] Button to exit the menu.**
The [ ] Indication ❶ appears.

- In a dimly lit place, the Super Image Stabilizer Function may not work. In this case, the [ ] Indication flashes.
- If [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu has been set to [GAINUP], the Super Image Stabilizer Function cannot be used. In this case, the [ ] Indication flashes.
- Under fluorescent lamps, the picture brightness may fluctuate and the colours may be unnatural.
- After-image distortion may occur.
- When you use a tripod, we recommend that you turn the Super Image Stabilizer Function off.

Cancelling the Super Image Stabilizer Function

Set [SIS] on the [CAMERA SETUP] Sub-Menu to [OFF].



Viewing the Just Recorded Scenes on the Movie Camera (Playback)

You can play back recorded scenes right after recording.

1 Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

- The [VCR] Lamp lights.

2 Press the Rewind Button [◀◀] to rewind the tape.

- Rewind the tape to the point where the recording was started.
- If the tape reaches the beginning, rewinding automatically stops.

3 Press the Play Button [▶] to start playback.

4 To stop playback:
Press the Stop Button [■].

■ Adjusting the Sound Volume

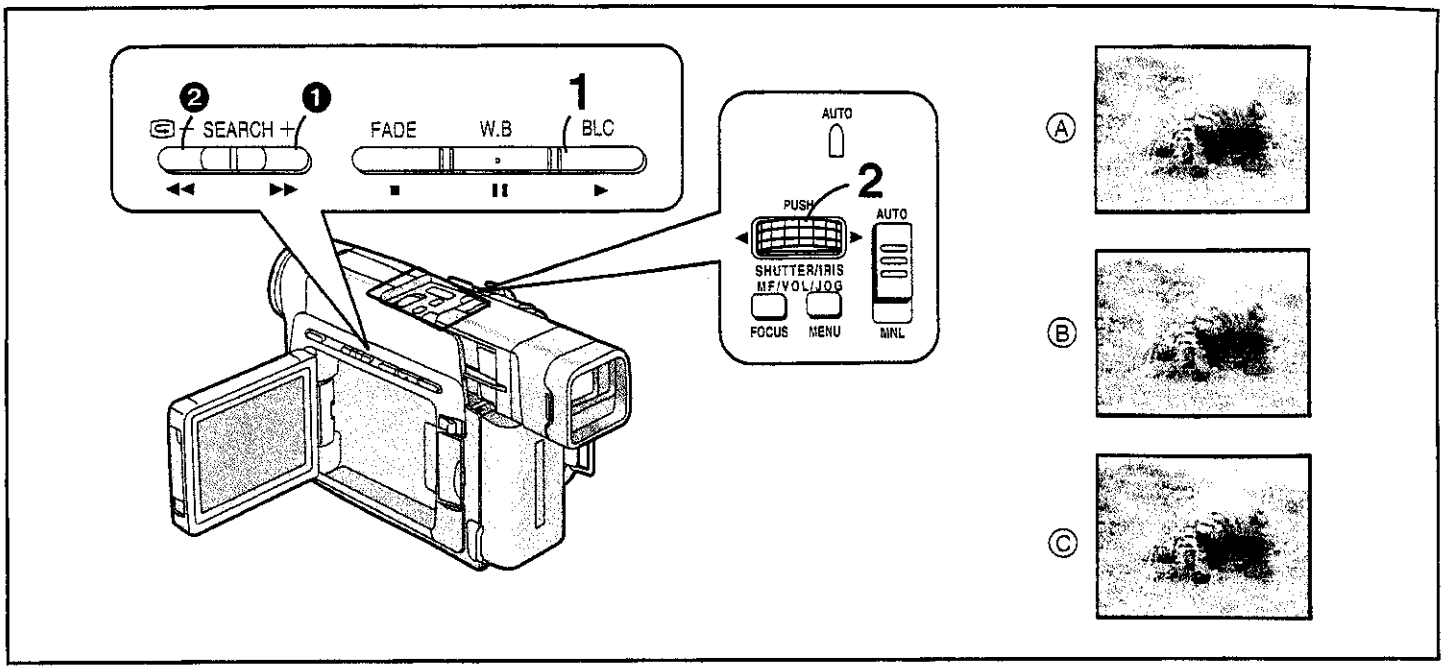
Keep the [PUSH] Dial ❶ pressed until the [VOLUME] Indication ❷ appears. Then, turn the [PUSH] Dial to adjust the volume. After adjusting, press the [PUSH] Dial to make the [VOLUME] Indication disappear.

To adjust the volume with the Remote Controller, press the [T] or [W] Button to make the [VOLUME] Indication appear. You can then increase the volume by pressing the [T] Button or decrease it by pressing the [W] Button. A few seconds after finishing the adjustment, the [VOLUME] Indication disappears.

- Only the volume of the sound from the Movie Camera's built-in speaker ❸ can be adjusted.
- When using the Playback Zoom Function, it is not possible to adjust the sound volume.

■ Repeat Playback

If you keep the Playback Button [▶] pressed for more than 5 seconds, the Movie Camera switches over to the Repeat Playback Mode and the [R ▷] Indication appears. To cancel the Repeat Playback Mode, set the [OFF/ON/MODE] Switch to [OFF].



Searching for a Scene That You Want to Play Back

Cue Playback Ⓐ

Keep the Cue Button [▶▶] ❶ pressed during playback.

Review Playback Ⓑ

Keep the Review Button [◀◀] ❷ pressed during playback.

Search Lock Function

For longer Cue or Review Playback, press the Cue Button [▶▶] or the Review Button [◀◀] only briefly. As this locks the search function, you do not need to keep the button pressed for a long time.

- To resume normal playback, press the Play Button [▶].
- In Cue and Review Playback, pictures with fast-moving subjects may contain mosaic-like patterns.

Hyper Check Function

- If you press the Fast-forward Button [▶▶] during fast-forwarding of the tape or the Rewind Button [◀◀] during rewinding of the tape, Cue Playback or Review Playback continues for as long as you keep the Button pressed.
- At the beginning and end of Cue Playback or Review Playback, some momentary picture distortion may occur.

Variable Speed Search Function Ⓒ

It is possible to change the speed of Cue Playback or Review Playback.

1 Press the Play Button [▶] during playback.

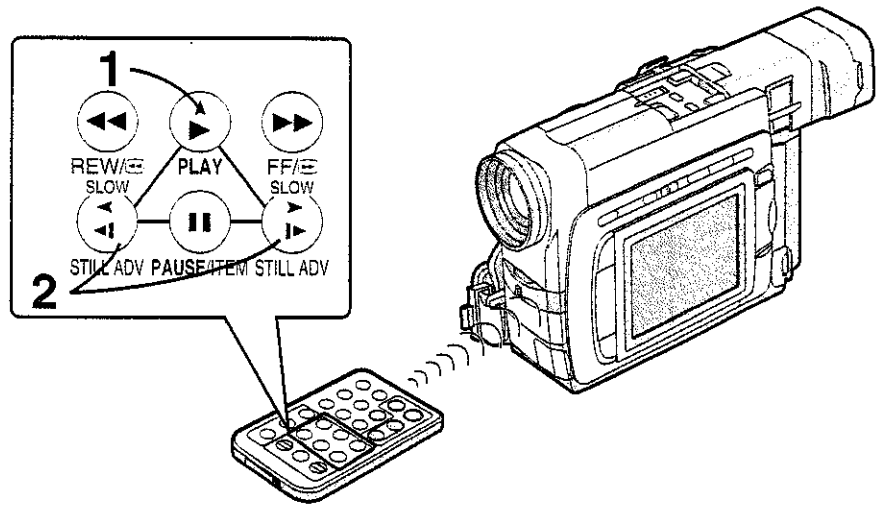
2 Turn the [PUSH] Dial to select the desired search speed.

The Variable Speed Search Function offers the following 6 different playback speeds both in forward and reverse directions: 1/5× (slow playback in SP Mode only), 1/3× (slow playback in LP Mode only), 1×, 2×, 5×, 10×, 20×

Returning to Normal Playback

Press the Play Button [▶].
Playback continues at normal speed.

- During Variable Speed Search, mosaic-like patterns appear in the picture.
- When using the Variable Speed Search Function, the sound is muted.



Playing Back in Slow Motion

(Slow Motion Playback)

1 Press the Play Button [▶].

2 Press the Slow Motion/Still Advance Button [◂I] or [I▸] on the Remote Controller.

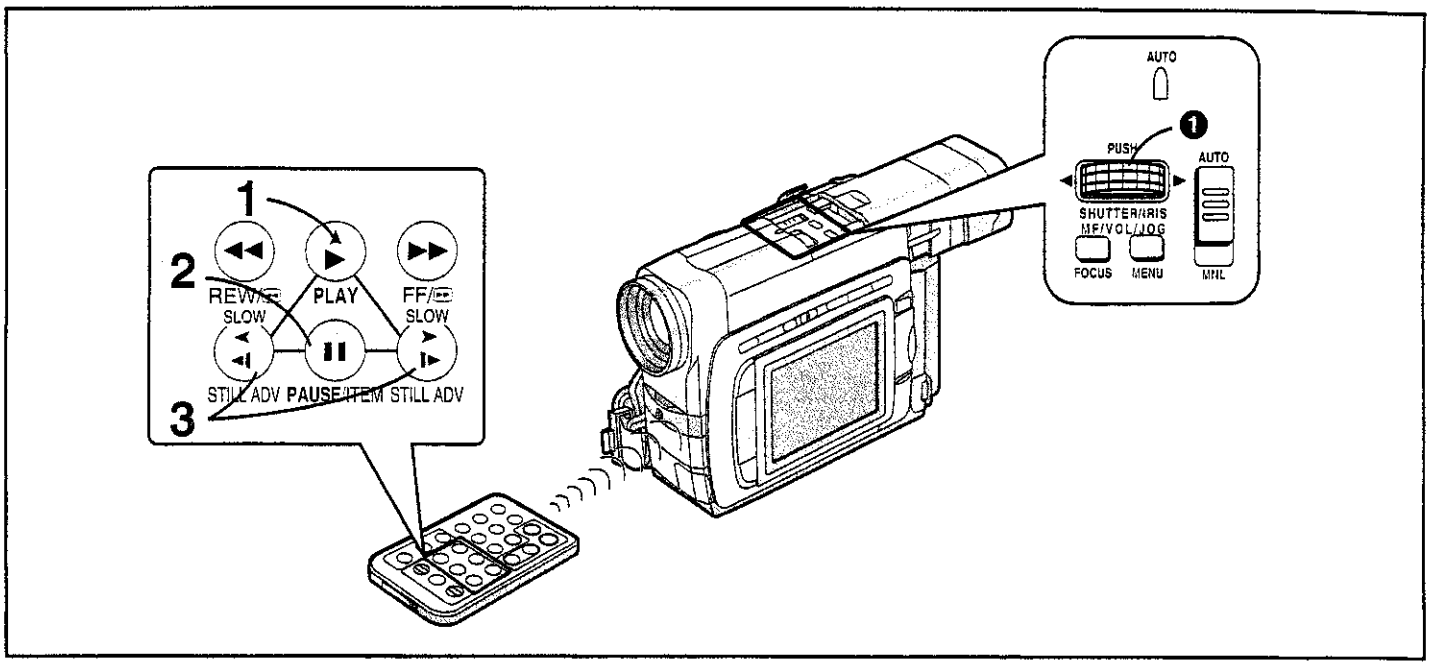
Pressing the [◂I] Button starts slow motion playback in reverse direction, and pressing the [I▸] Button starts slow motion playback in forward direction.

Scenes recorded in the SP Mode are played back at approximately 1/5th of the normal speed.
Scenes recorded in the LP Mode are played back at approximately 1/3rd of the normal speed.

- During slow motion playback in reverse direction, the Time Code Indication may not be accurate.
- When you play back the picture recorded in the Picture-in-Picture Mode (➜ 39) or Multi-Picture Mode (➜ 39), the picture may shake vertically.

Resuming Normal Playback

Press the Play Button [▶].
Playback continues at normal speed.



Playing Back Still Pictures and Advancing Them One by One

(Still Playback/Still Advance Playback)

You can freeze the action during playback and advance the still pictures one by one.

1 Press the Play Button [▶].

2 Press the Pause Button [❚❚].
The playback picture stops in the Still Playback Mode.

3 Press the Slow Motion/Still Advance Button [◄❚] or [❚►] on the Remote Controller.
Pressing the [◄❚] Button advances the still picture one by one in reverse direction. Pressing the [❚►] Button advances the still picture one by one in forward direction.

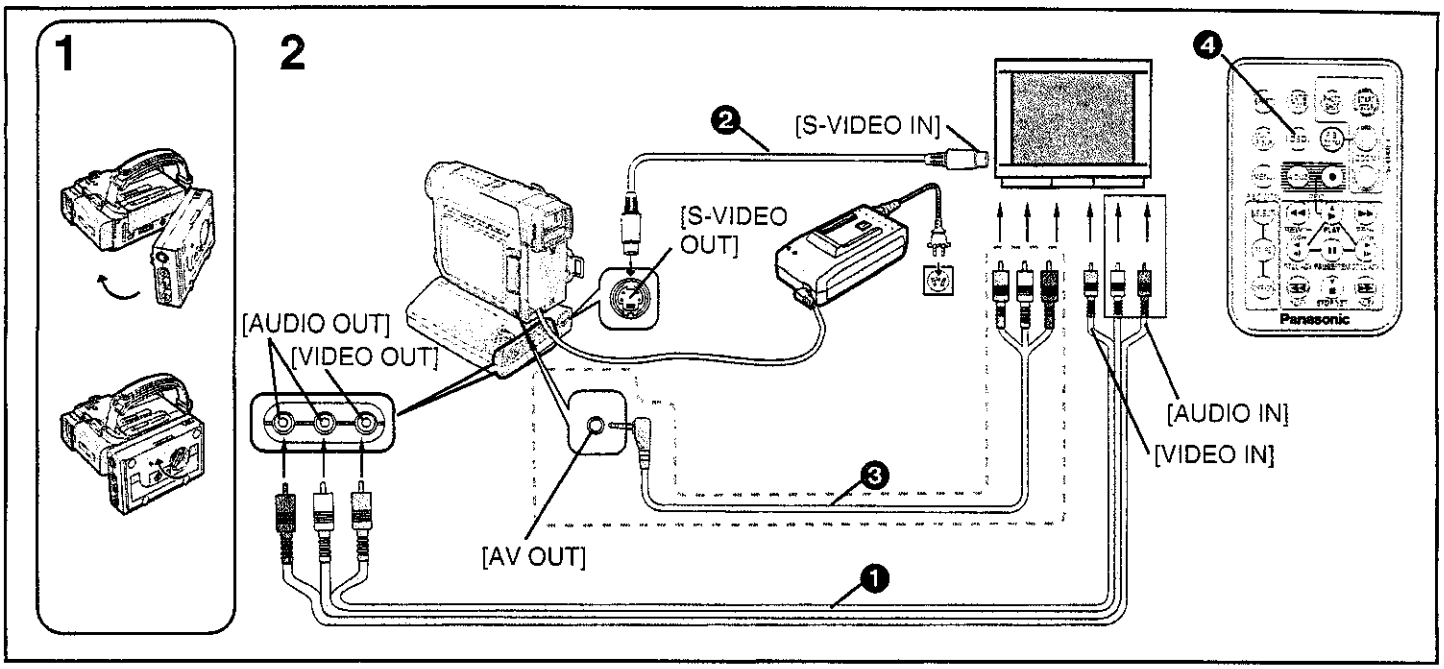
- Each press of the [◄❚] Button advances to the next still picture in reverse direction. Each press of the [❚►] Button advances to the next still picture in forward direction. Keeping either button pressed continuously advances the still picture one by one until you release the button.
- If you leave the Movie Camera in the Still Playback Mode for more than 6 minutes, it switches over to the Stop Mode to protect the video heads against excessive wear.
- During Still Advance Playback, the Time Code Indication may not be accurate.
- During Still Playback, adjusting the sound volume is not possible.

Resuming Normal Playback

Press the Play Button [▶].
Playback continues at normal speed.

Using the Jog Dial (Jog Playback)

By turning the Jog Dial ([PUSH] Dial) ❶ on the Movie Camera in the Still Playback Mode, you can advance the still pictures one by one in forward or reverse direction.



Playing Back on a TV

(With the Output Terminal Box [AV ONE TOUCH STATION] Attached)

Attaching the Output Terminal Box [AV ONE TOUCH STATION] to the Movie Camera makes it possible to play back recorded scenes on a TV.

1 Attach the Output Terminal Box [AV ONE TOUCH STATION].

2 Connect the Video and Audio Output Socket on the Output Terminal Box [AV ONE TOUCH STATION] with the Video and Audio Input Sockets on the TV.

Use the AV Cable (PHONO-PHONO) ❶ to connect to the TV. If your TV is equipped with an S-Video Socket, also connect the S-Video Cable ❷.

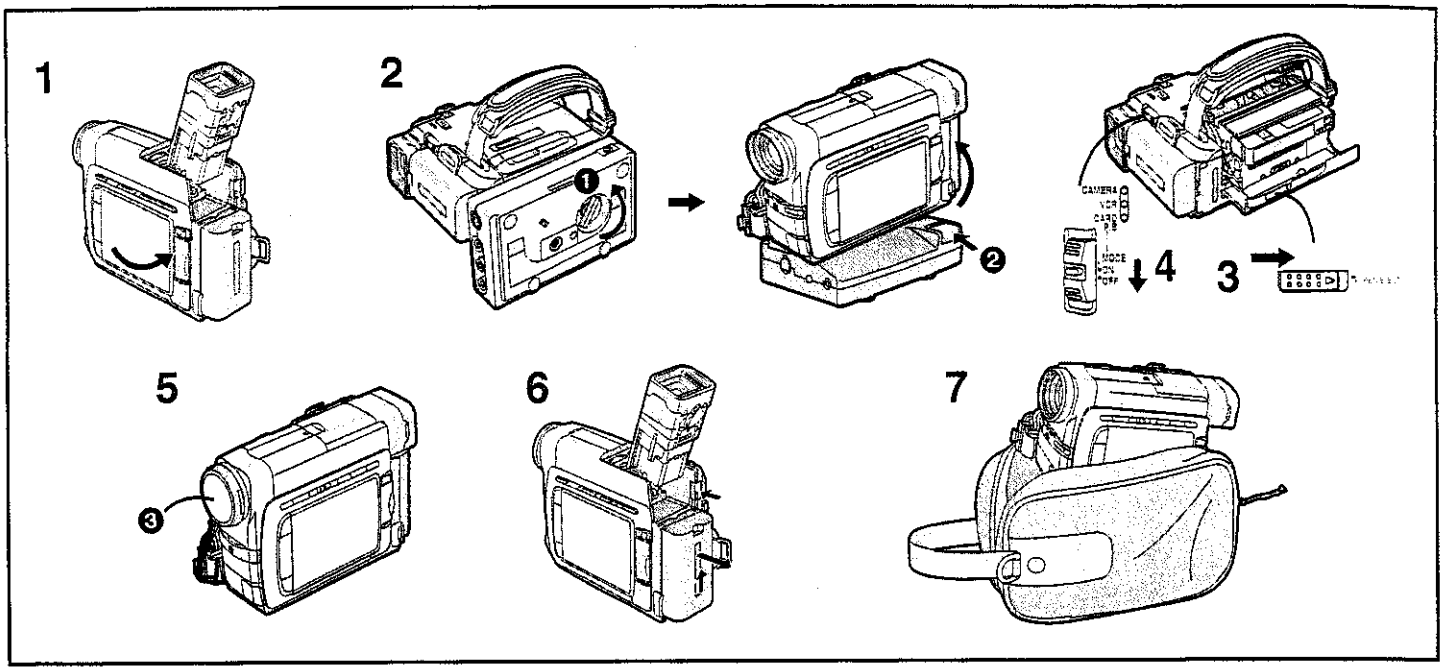
Easy Playback on a TV

Instead of connecting the Movie Camera to the TV through the Output Terminal Box [AV ONE TOUCH STATION], you can use the AV Cable (PHONO-M3) ❸ to connect [AV OUT] on the Movie Camera directly to the Video and Audio Input Sockets on the TV. The plug for the [AV OUT] Socket must be inserted completely.

- Do not connect both supplied AV Cables to the TV at the same time.
- Before connecting, turn off both the Movie Camera and the TV.
- Before attaching the Output Terminal Box [AV ONE TOUCH STATION] to the Movie Camera, clean the Multi Terminal on the underside of the Movie Camera.
- If a cassette recorded with copyright protection signal (Copy Guard) is played back, the picture is distorted by mosaic-like patterns. However, scenes recorded with this Movie Camera do not contain a copyright protection signal.

Making the Indications Appear on the TV Screen

Press the [OSD] Button ❹ on the Remote Controller.
The On-Screen Indications also appear on the TV screen.



After Use

1 **Close the LCD Monitor.**

2 **Loosen the locking screw ❶ and remove the Output Terminal Box [AV ONE TOUCH STATION] while pressing the [PUSH RELEASE] Button ❷.**
Hold both the Movie Camera and the Output Terminal Box firmly to prevent them from dropping.

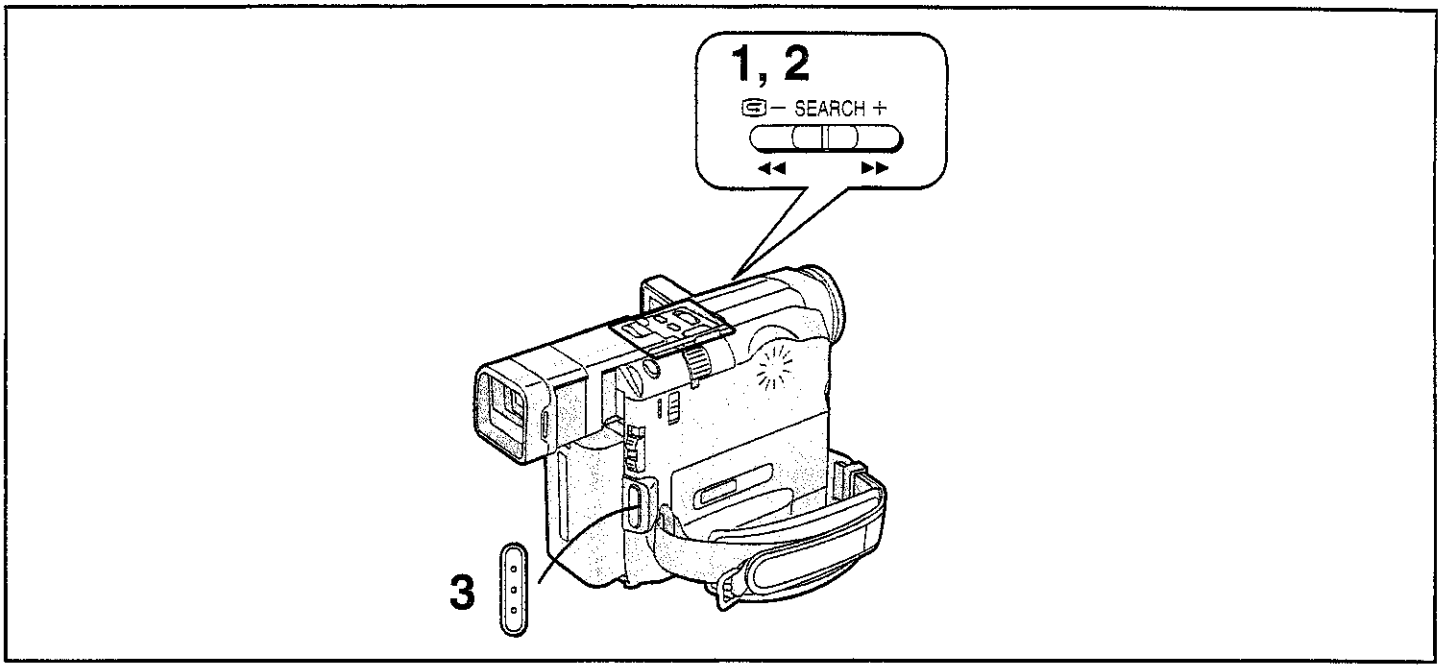
3 **Take out the cassette.** (→ 11)

4 **Set the [OFF/ON/MODE] Switch to [OFF].**

5 **Attaching the Lens Cap**
After use, attach the supplied Lens Cap ❸ to the Lens to protect it.

6 **Remove the Battery and retract the Finder.** (→ 9)

7 **Insert the Movie Camera into the Soft Bag.**



Viewing Recorded Scenes During Recording Pause (Camera Search)

You can view recorded scenes when the Movie Camera is in the Recording Pause Mode.
The Camera Search Function is convenient to search for a scene from which you want to start recording a new scene with smooth scene-to-scene transition.

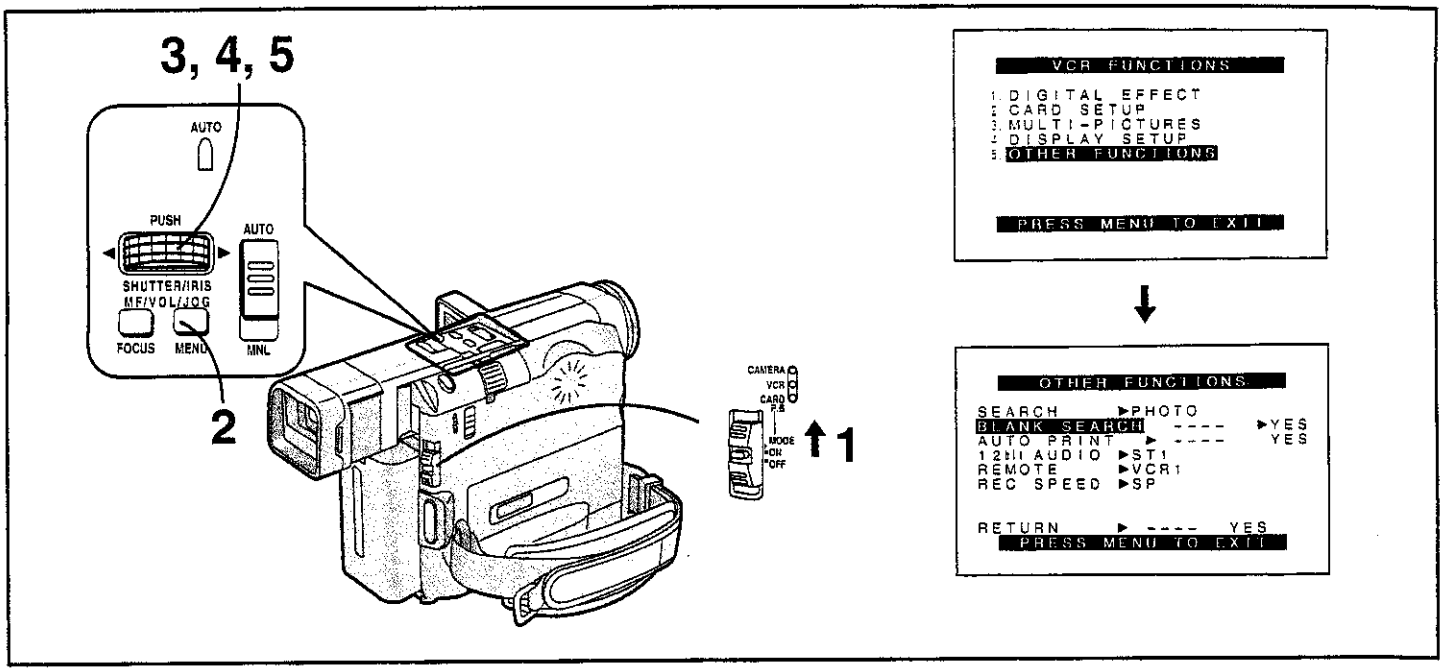
1 Keep the Reverse Search Button [–SEARCH] or the Forward Search Button [SEARCH+] pressed for more than 1 second.
Pressing the [–SEARCH] Button plays back the picture in reverse direction.
Pressing the [SEARCH+] Button plays back the picture in forward direction.

Starting to Record from the Desired Position

2 Release the pressed Search Button.
The Movie Camera is in the Recording Pause Mode.

3 Press the Recording Start/Stop Button to start recording.
The Movie Camera starts recording a new scene with smooth scene-to-scene transition.

- In the Camera Search Mode, the picture may contain mosaic-like patterns. However, this is a phenomenon particular to digital video and completely normal.
- If the Recording Speed Mode (SP/LP) of the previous and the new recording are different, the playback picture may be distorted.



Searching for the End of the Recorded Part on a Cassette (Blank Search)

With the Blank Search Function, you can quickly locate the end of the recorded part on a cassette (or a blank part between recordings).

1 **Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.**
The [VCR] Lamp lights.

2 **Press the [MENU] Button.**
The [VCR FUNCTIONS] Main-Menu appears.

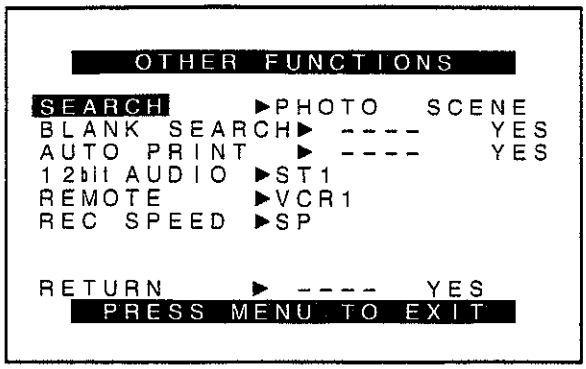
3 **Turn the [PUSH] Dial to select [OTHER FUNCTIONS] and then press the [PUSH] Dial.**
The [OTHER FUNCTIONS] Sub-Menu appears.

4 **Turn the [PUSH] Dial to select [BLANK SEARCH].**

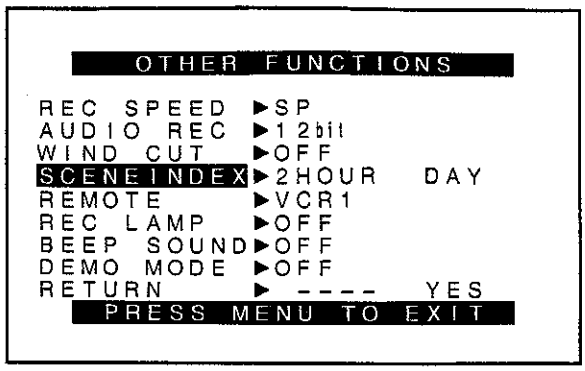
5 **Press the [PUSH] Dial to select [YES].**
Approximately 1 second before the end of the last recorded scene, the Movie Camera switches over to the Still Playback Mode.

- If there is no blank part on a cassette, the Movie Camera stops at the end of the tape.
- If you set the [OFF/ON/MODE] Switch to [CAMERA] and then start recording after the Blank Search has finished, the new scene will be joined to the end of the last recorded scene with a smooth transition.
- To cancel the Blank Search before it finishes, press the [■] Button.

Ⓐ



Ⓑ



Searching for the Beginning of Recorded Scenes Marked with Index Signal (Index Search)

To allow easy searching for desired scenes, this Movie Camera automatically records index signals during recording as follows:

❶ Photoshot Index Signal

To search for still pictures recorded in the Photoshot Mode **(➜ 20)** and to use for automatic printing **(➜ 83)**.
A photoshot index signal is automatically recorded every time you record a still picture in the Photoshot Mode.

- However, in the Continuous Photoshot Mode **(➜ 20)**, no photoshot index signals are recorded.

❷ Scene Index Signal

To search for the beginning of recorded scenes.
A scene index signal is automatically recorded in the following cases:

- When you start recording after inserting a cassette. However, if you switch the Movie Camera from the VCR Mode over to the Camera Mode or set the date and/or time before you start recording, no index signal is recorded.
- According to the setting of [SCENEINDEX] on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu:

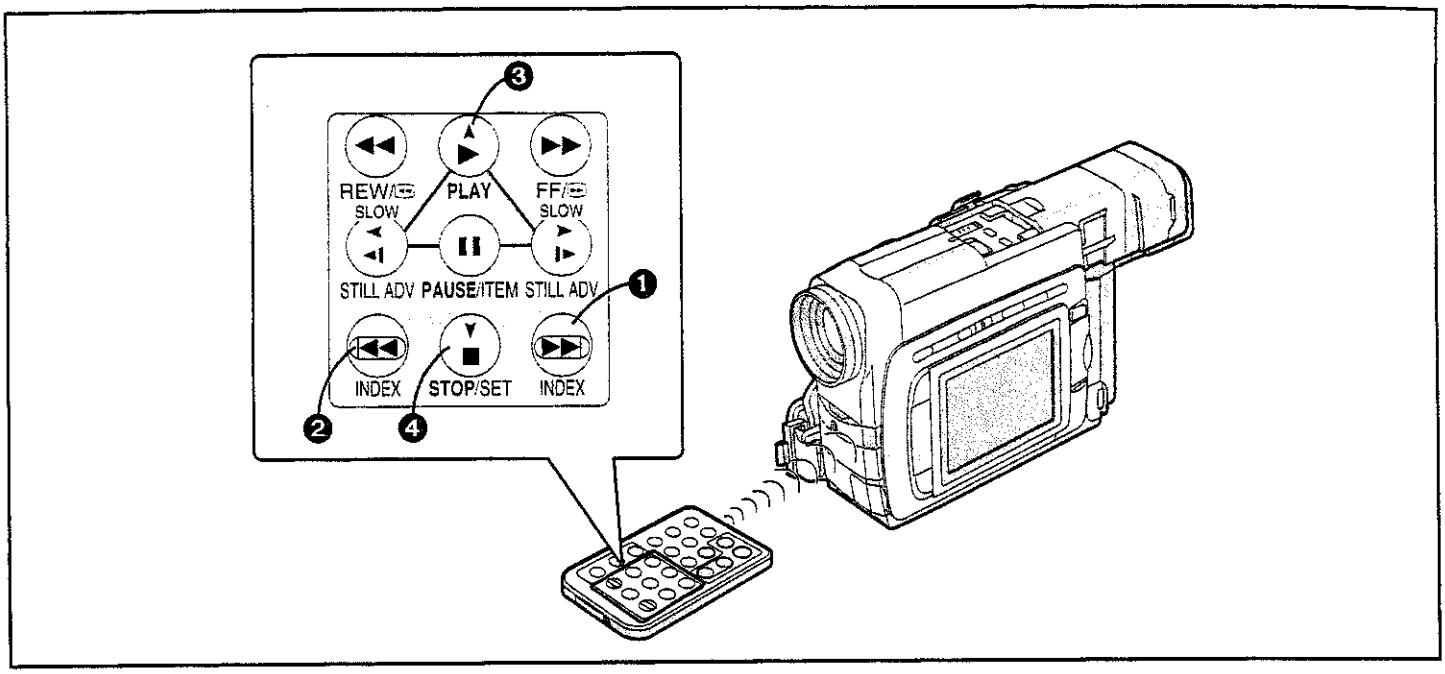
  [2HOUR]: An index signal is recorded when recording is restarted after a lapse of more than 2 hours.

  [DAY]: An index signal is recorded when recording is restarted after the date has changed since the last recording.

(While an index signal is being recorded, the [INDEX] Indication flashes for a few seconds.)

Ⓐ: [OTHER FUNCTIONS] Sub-Menu in the VCR Mode

Ⓑ: [OTHER FUNCTIONS] Sub-Menu in the Camera Mode



Searching for Photoshot Pictures

(Photoshot Index Search)

- Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.
- Set [SEARCH] on the [OTHER FUNCTIONS] Sub-Menu to [PHOTO].

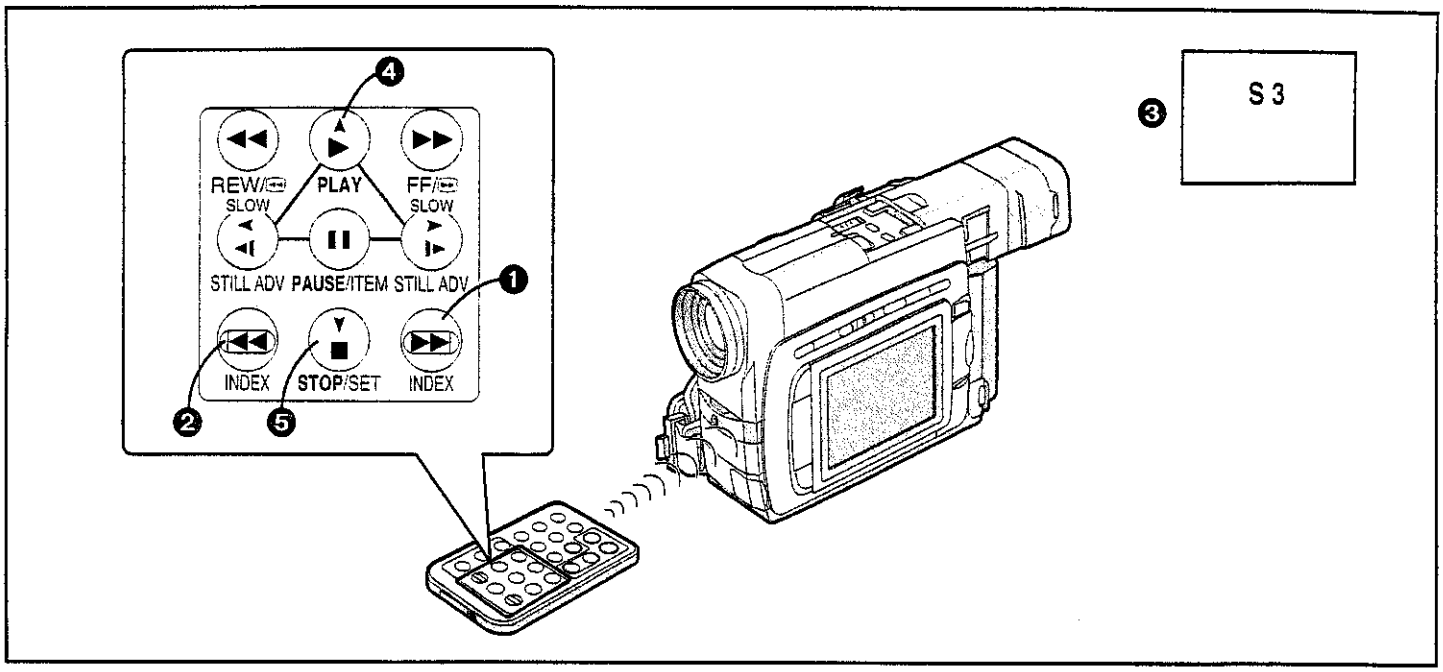
Photoshot Index Search in Forward Direction

Press the Index Button [▶▶I] ❶ on the Remote Controller.

Photoshot Index Search in Reverse Direction

Press the Index Button [I◀◀] ❷ on the Remote Controller.

- At every press of the corresponding button, the tape is fast-forwarded or rewound to the next still picture recorded in the Photoshot Mode.
  After reaching the next still picture, the still picture is played back continually, however the sound only for approximately 4 seconds. (If you leave the Movie Camera in the Still Playback Mode for more than 6 minutes, it switches over to the Stop Mode to protect the video heads against excessive wear.)
- The Photoshot Index Search may not work correctly for still pictures recorded near the beginning of the tape.
- As no photoshot index signals are recorded for still pictures recorded in the Continuous Photoshot Mode **(➔ 20)**, the Photoshot Index Search Function cannot be used to search for these still pictures.
- If you keep the [I◀◀] or [▶▶I] Button pressed for more than 2 seconds, the Intro Search Function is activated and it plays back all still pictures recorded in the Photoshot Mode on the cassette one after another for a few seconds each.
  (To cancel the Intro Search Function, press the Play Button [▶] ❸ or the Stop Button [■] ❹.)



Searching for the Beginning of Recorded Scenes
(Scene Index Search)

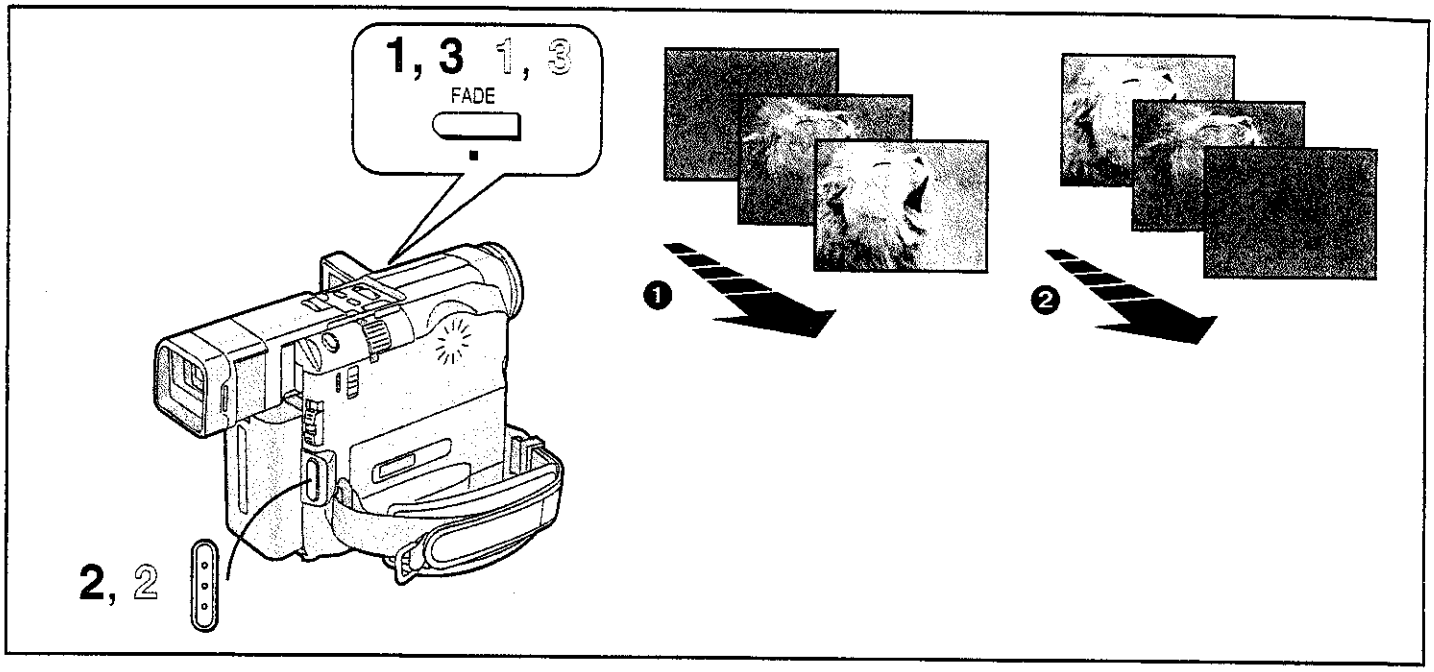
- Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.
- Set [SEARCH] on the [OTHER FUNCTIONS] Sub-Menu to [SCENE].

Scene Index Search in Forward Direction
Press the Index Button [▶▶I] ❶ on the Remote Controller.

Scene Index Search in Reverse Direction
Press the Index Button [I◀◀] ❷ on the Remote Controller.

- When you briefly press the corresponding button once, the [S 1] Indication appears and the search for the next scene marked with an index signal starts. After the Scene Index Search has started, every time you press the button, the indication changes successively from [S 2] to [S 9], and the beginning of the scene corresponding to the selected number is located. ❸ After reaching the desired scene, playback starts automatically. (At a time, Scene Index Search in forward or reverse direction is possible up to the ninth scene marked with index signal from the present tape position.)

- If the interval between two scene index signals is less than 1 minute, the Scene Index Search may not work correctly.
- The Scene Index Search may not work correctly for scenes recorded near the beginning of the tape.
- If you keep the [I◀◀] or [▶▶I] Button pressed for more than 2 seconds, the Intro Search Function is activated and it plays back the beginning of all scenes marked with an index signal on the cassette one after another for a few seconds each. (To cancel the Intro Search Function, press the Play Button [▶] ❹ or the Stop Button [■] ❺.)



Fading In/Out

Fading In ❶

Fading-in lets you make the picture and sound appear gradually from a black screen at the beginning of a scene.

1 **With the Movie Camera in the Recording Pause Mode, keep the Fade Button [FADE] pressed.**
The picture gradually disappears.

2 **When the picture has completely disappeared, press the Recording Start/Stop Button to start recording.**

3 **Approximately 3 seconds after the recording has started, release the Fade Button [FADE].**
The picture gradually appears again.

Fading Out ❷

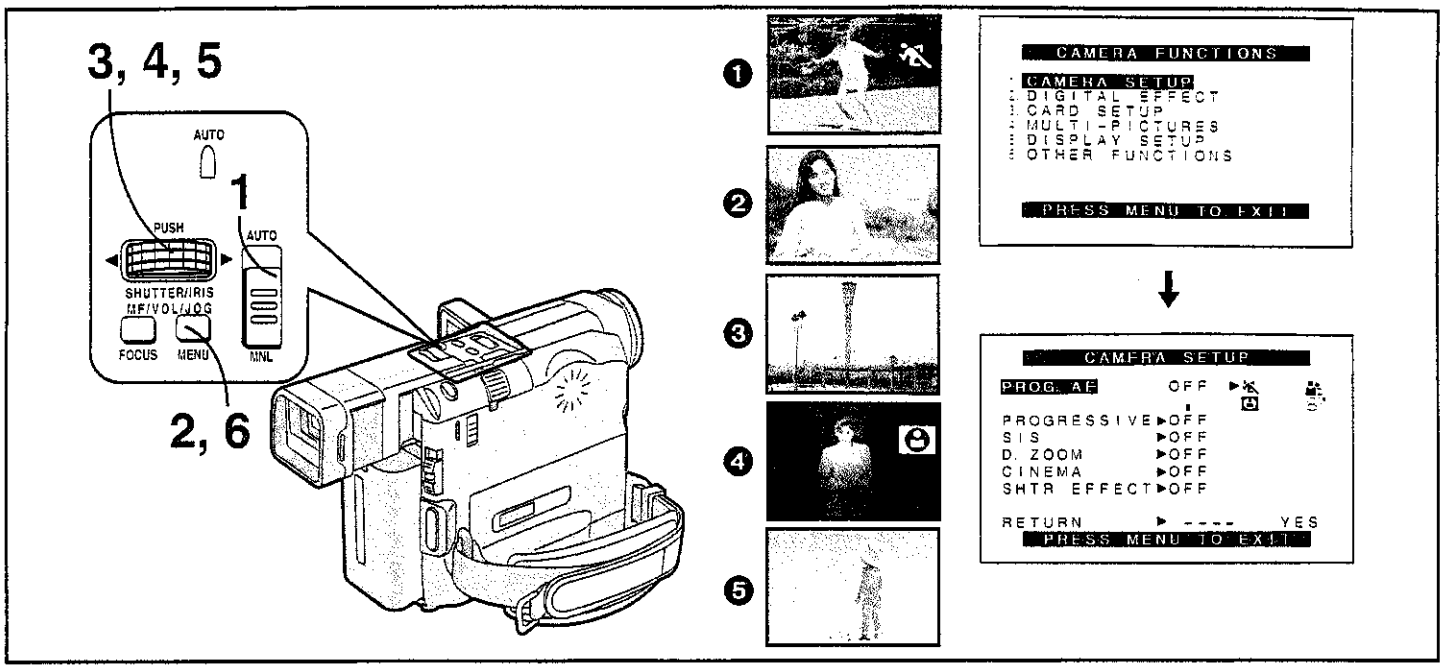
Fading-out lets you make the picture and sound disappear gradually into a black screen at the end of a scene.

1 **During recording, keep the Fade Button [FADE] pressed.**
The picture gradually disappears.

2 **After the picture has completely disappeared, press the Recording Start/Stop Button to stop recording.**
The Movie Camera is in the Recording Pause Mode.

3 **Release the Fade Button [FADE].**

Fading-in and fading-out cannot be used when recording still pictures in the Photoshot or Multi-Picture Mode, and for the small still picture in the Picture-in-Picture Mode.



Recording In Special Situations

(Programme AE)

This function lets you select Automatic Exposure settings optimized for special recording situations.

1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

2 **Press the [MENU] Button.**
The [CAMERA FUNCTIONS] Main-Menu appears.

3 **Turn the [PUSH] Dial to select [CAMERA SETUP] and then press the [PUSH] Dial.**
The [CAMERA SETUP] Sub-Menu appears.

4 **Turn the [PUSH] Dial to select [PROG.AE].**

5 **Press the [PUSH] Dial to select the desired mode ([ ], [ ], [ ], [ ] or [ ]).**

6 **Press the [MENU] Button to exit the menu.**
The indication of the selected mode appears.

[ ] Sports Mode ❶
To record scenes with fast-moving subjects such as sports scenes.
[ ] Portrait Mode ❷
To make subjects stand out sharply from the background.
[ ] Low Light Mode ❸
To record dark scenes more brightly.
[ ] Spotlight Mode ❹
To record subjects under bright spotlights such as at a party, in the theatre, etc.
[ ] Surf & Snow Mode ❺
To record subjects in brightly lit surroundings such as on a ski slope, beach, etc.

Cancelling the Programme AE Function

Set [PROG.AE] on the [CAMERA SETUP] Main-Menu to [OFF]. Or set the Mode Selector Switch to [AUTO].

It is not possible to adjust the shutter speed (➔ 51) or the iris value (➔ 52) when one of the Programme AE Modes is selected.

Sports Mode

- When playing back scenes recorded in the Sports Mode, you can enjoy slow motion and still playback of very sharp images with fine details.
- During normal playback, movements in the picture may not be smooth.
- Avoid recording under fluorescent, mercury-vapour or natrium lamps in this mode, as the colour and the brightness of the playback picture might fluctuate.
- When recording subjects lit by strong lights or with much light reflection, the playback picture may contain vertical streaks of light.
- When the scene is not sufficiently lit, the [ ] indication flashes.
- When using this mode for recording indoors, the playback picture may flicker.
- It is not possible to use the Sports Mode [ ] together with the Gain-up Mode [GAINUP].
- When recording still pictures in the Progressive Photoshot Mode while the Sports Mode is activated, the brightness of the recorded still pictures may be unstable.

Portrait Mode

- When using this mode for recording indoors, the playback picture may flicker.
- It is not possible to use the Portrait Mode [ ] together with the Gain-up Mode [GAINUP].
- When recording still pictures in the Progressive Photoshot Mode while the Portrait Mode is activated, the brightness of the recorded still pictures may be unstable.

Low Light Mode

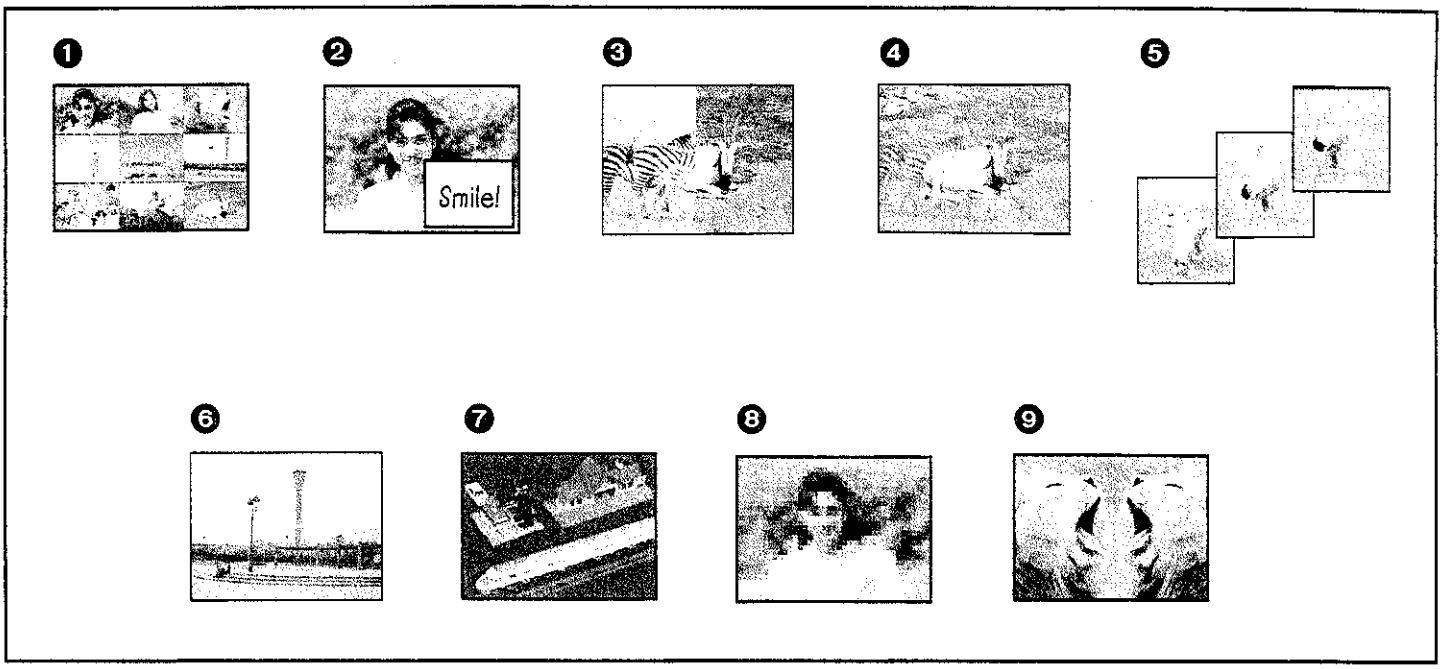
- It may not be possible to sufficiently brighten up extremely dark scenes.

Spotlight Mode

- When using this mode, the recorded picture may be extremely dark.
- If a subject is extremely bright, the recorded picture may be whitish.

Surf & Snow Mode

- If a subject is extremely bright, the recorded picture may be whitish.



Recording with Special Effects
(Digital Effects)

There are 13 different modes available for adding special digital picture effects.

Digital Effects 1 [EFFECT1]

❶ **Multi-Picture Mode [MULTI]**
The screen is divided into 9 small still fields. For details, **(➔ 42, 43)**.

❷ **Picture-in-Picture Mode [P-IN-P]**
A small still picture is inserted and displayed inside the normal picture. For details, **(➔ 45)**.

❸ **Wipe Mode [WIPE]**
It gradually replaces a picture of the last previously recorded scene with the picture of the new scene, like drawing a curtain. For details, **(➔ 46)**.

❹ **Mix Mode [MIX]**
It gradually fades out the picture of the last previously recorded scene while fading in the picture of the new scene. For details, **(➔ 47)**.

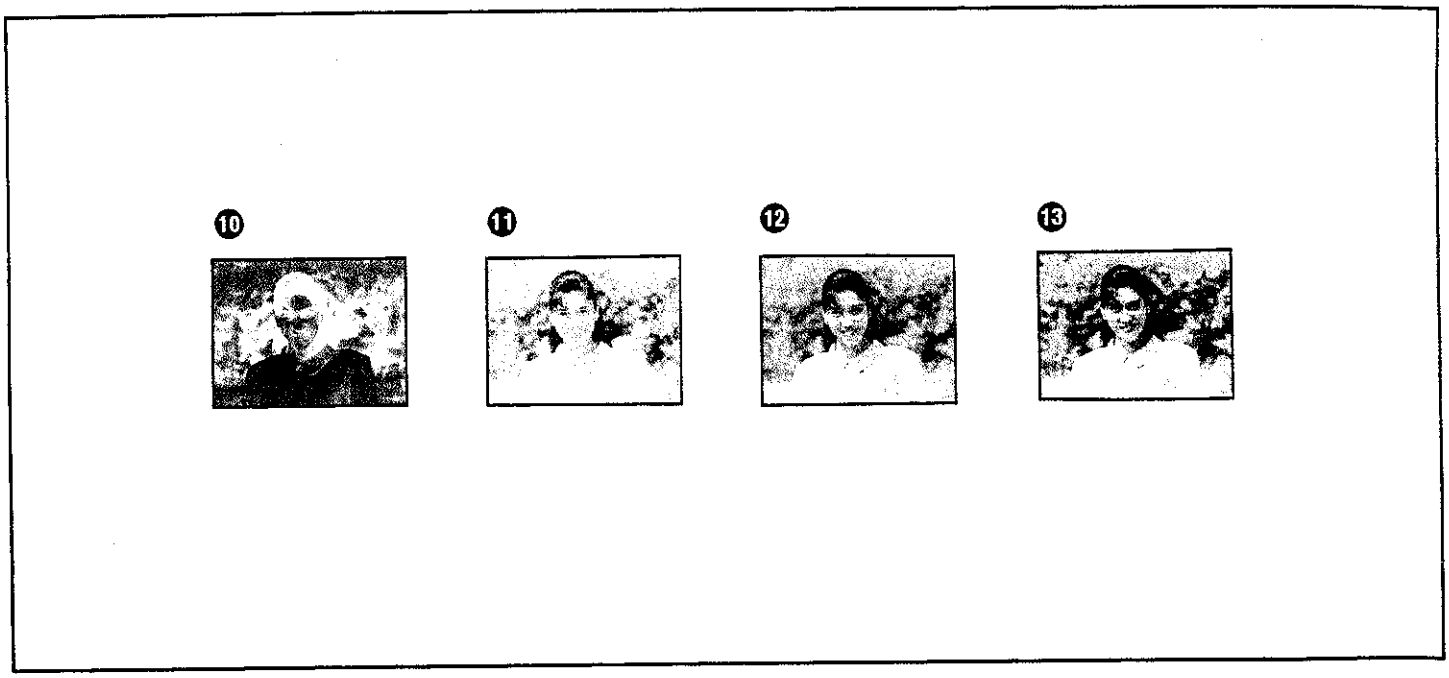
❺ **Strobe Mode [STROBE]**
It records the pictures with a stroboscope-like effect.

❻ **Gain-up Mode [GAINUP]**
It electronically brightens up the picture.
In this mode, adjust the focus manually.

❼ **Trailing Effect Mode [TRACER]**
The picture is recorded with a trailing effect.

❽ **Mosaic Mode [MOSAIC]**
The picture becomes mosaic-like.

❾ **Mirror Mode [MIRROR]**
The right half of the picture is a mirror image of the left half.



Recording with Special Effects
(Digital Effects) (Continued)

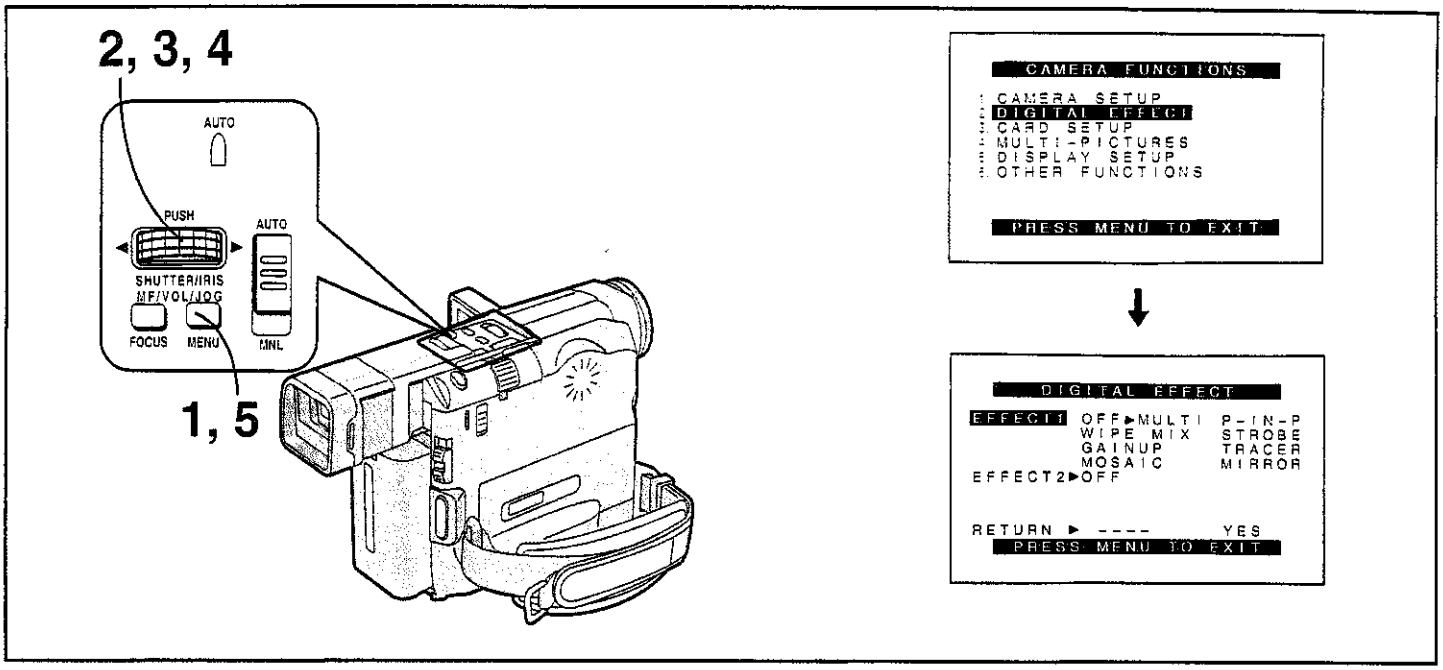
Digital Effects 2 [EFFECT2]

⑩ Negative Mode [NEGA]
The recorded pictures have reversed colours similar to photographic negatives.

⑪ Sepia Mode [SEPIA]
Scenes are recorded with a brown tint similar to the colour of old photographs.

⑫ Black & White Mode [B/W]
The picture is recorded in black and white.

⑬ Solarisation Mode [SOLARI]
The picture is recorded with an effect similar to a painting.



Recording with Special Effects

(Digital Effects) (Continued)

Selecting the Desired Digital Effect

1 Press the [MENU] Button.
The [CAMERA FUNCTIONS] Main-Menu appears.

2 Turn the [PUSH] Dial to select [DIGITAL EFFECT] and then press the [PUSH] Dial.
The [DIGITAL EFFECT] Sub-Menu appears.

3 Turn the [PUSH] Dial to select [EFFECT1] or [EFFECT2].

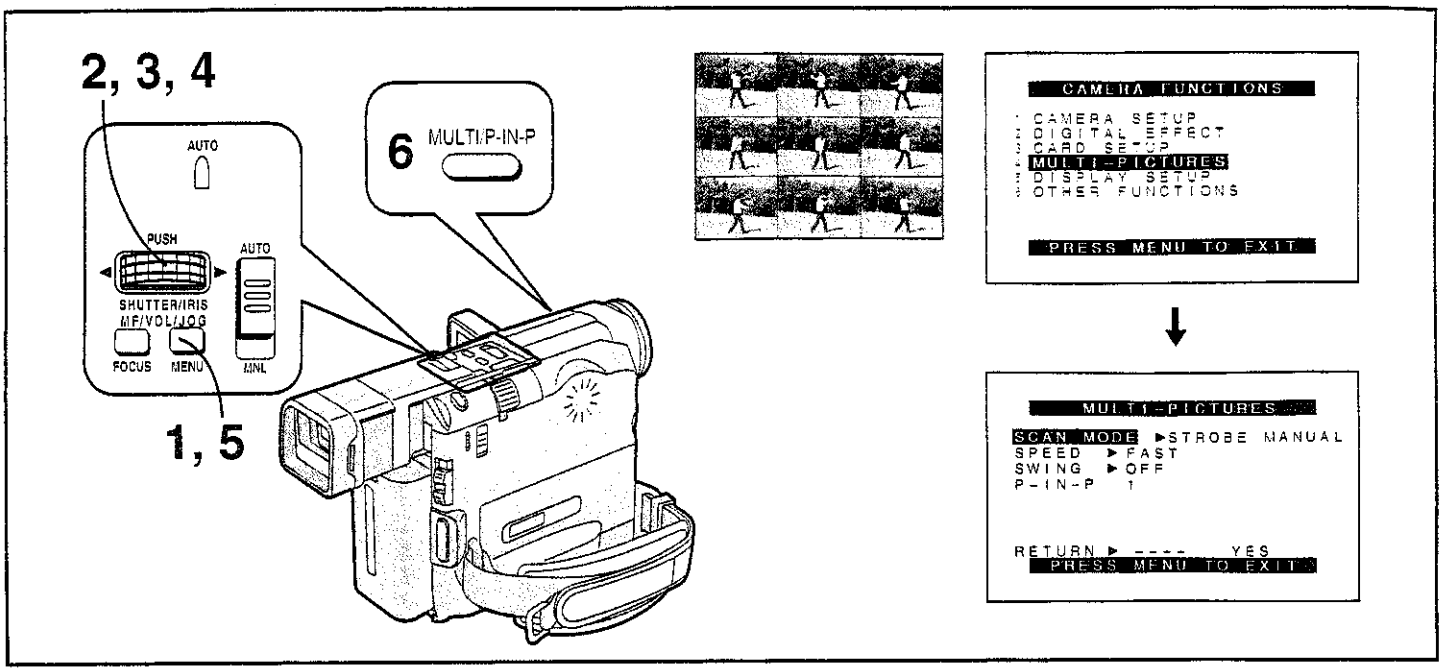
4 Press the [PUSH] Dial to select the desired digital effect.

5 Press the [MENU] Button to exit the menu.
- The picture now has the selected digital effect. However, the Multi-Picture Function, Picture-in-Picture Function, Wipe Function and Mix Function require additional operations to make their effect visible. **(➔ 42, 43, 45, 46, 47)**

- If you have set [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu to [GAINUP], you need to adjust the focus manually; however, adjusting the shutter speed and selecting a white balance mode are not possible.
- If you have set [EFFECT2] on the [DIGITAL EFFECT] Sub-Menu to [B/W] or [SEPIA], changing the selected white balance mode is not possible.
- It is not possible to select the Sports Mode [ ] or the Portrait Mode [ ] together with the Gain-up Mode [GAINUP] on the [DIGITAL EFFECT] Sub-Menu.
- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON], it is not possible to use any of the digital modes in [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu. **(➔ 22)**

Cancelling the Digital Effect

Set [EFFECT1] or [EFFECT2] on the [DIGITAL EFFECT] Sub-Menu to [OFF].



Recording with Special Effects

(Digital Effects) (Continued)

■ Strobe Multi-Picture Mode

This function captures and displays a sequence of 9 small still pictures.

After setting [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu to [MULTI]... (➔ 41)

1 Press the [MENU] Button.

2 Turn the [PUSH] Dial to select [MULTI-PICTURES] and then press the [PUSH] Dial.
The [MULTI-PICTURES] Sub-Menu appears.

3 Turn the [PUSH] Dial to select [SCAN MODE] and then press the [PUSH] Dial to select [STROBE].

4 Turn the [PUSH] Dial to select [SPEED] and then press the [PUSH] Dial to select the desired strobe speed.
At the [FAST] setting, the sequence of 9 still pictures is captured within approximately 1 second, at [NORMAL] with approximately 2 seconds, and at [SLOW] within approximately 3 seconds.

5 Press the [MENU] Button to exit the menu.

6 Press the [MULTI] Button.
A sequence of 9 still pictures appears.

- To record the displayed Multi Mode still pictures onto the tape, press the Recording Start/Stop Button or the [PHOTO SHOT] Button.

Swing Mode

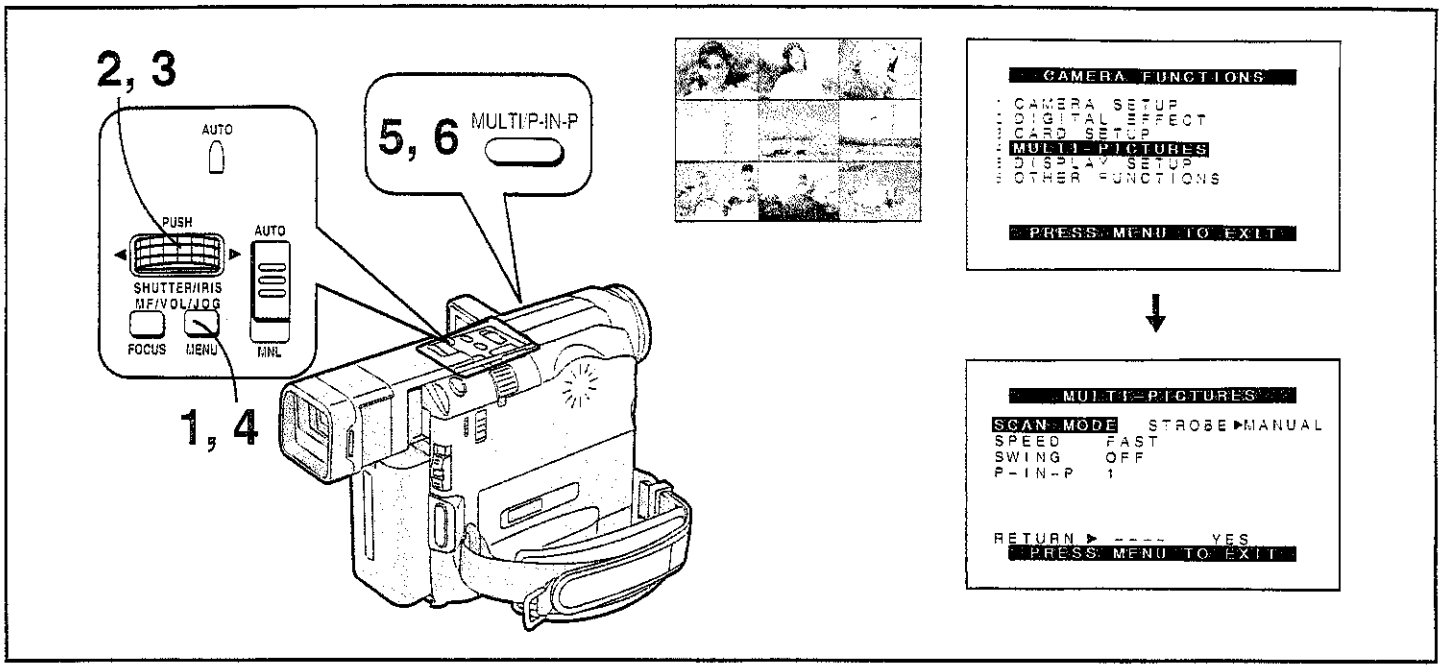
If you set [SWING] on the [MULTI-PICTURES] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu to [ON], the intervals at which the 9 still pictures are taken are longer at the beginning and end than in the middle of the swing strobe period.

Making the Multi-Pictures Disappear

Press the [MULTI] Button.

Displaying the Multi-Pictures Again

Press the [MULTI] Button for more than 1 second.



Recording with Special Effects

(Digital Effects) (Continued)

■ Manual Multi-Picture Mode

With this function, you can capture up to 9 small still pictures and display them together on the same screen.

After setting [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu to [MULTI]... (➔ 41)

1 Press the [MENU] Button.

2 Turn the [PUSH] Dial to select [MULTI-PICTURES] and then press the [PUSH] Dial.
The [MULTI-PICTURES] Sub-Menu appears.

3 Turn the [PUSH] Dial to select [SCAN MODE] and then press the [PUSH] Dial to select [MANUAL].

4 Press the [MENU] Button to exit the menu.

5 Press the [MULTI] Button once to activate the Multi-Picture Mode.

6 Point the Movie Camera at the desired scene and press the [MULTI] Button again for each of the up to 9 still pictures that you want to capture.

Making All Multi-Pictures Disappear

After displaying 9 pictures, it is possible to make them disappear in one go by pressing the [MULTI] Button.

Displaying the Multi-Pictures Again

Press the [MULTI] Button for more than 1 second.

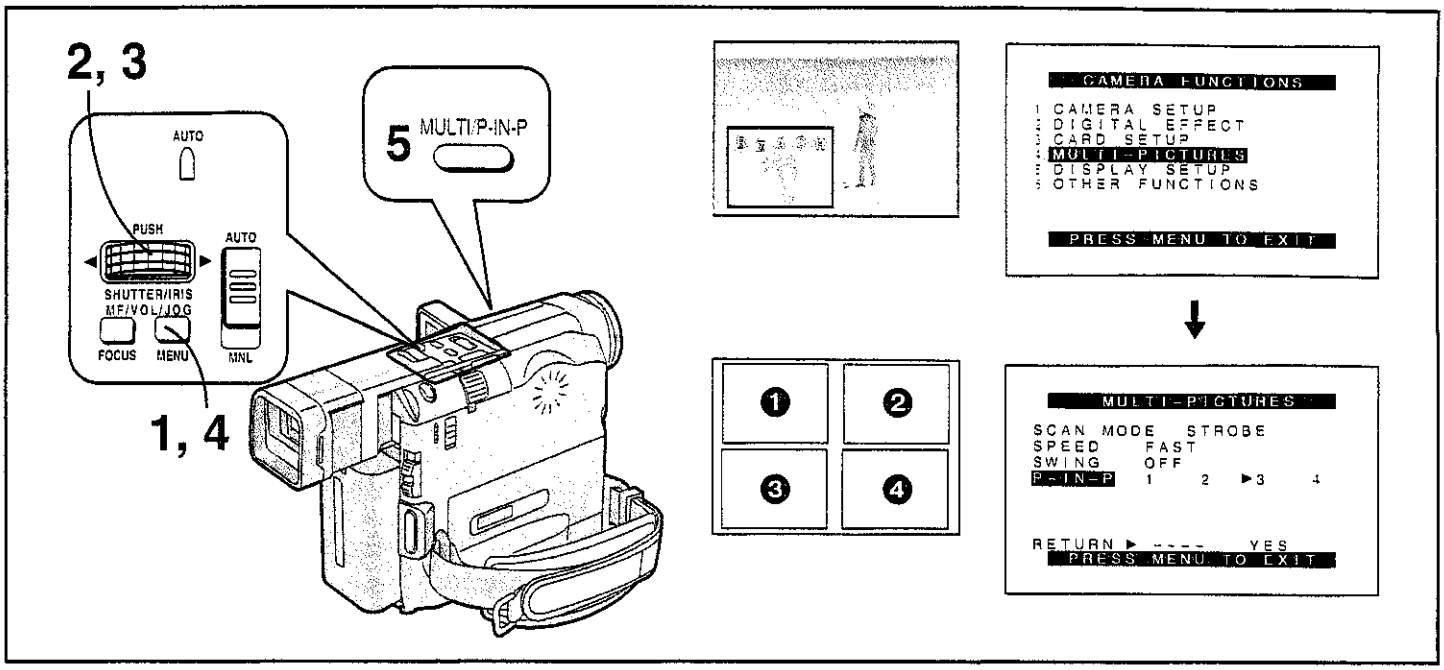
Erasing the Multi-Pictures One by One

While the still pictures are displayed, press the [MULTI] Button for more than 1 second.

- This erases the last captured picture. Keeping the [MULTI] Button pressed erases the pictures continuously.
- After you have erased the still pictures one by one, it is not possible to display them again.

Notes for Using the Multi-Picture Mode

- It is not possible to use the Multi-Picture Mode when [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON].
- When using the Mirror Mode with the LCD Monitor facing forward, pressing the [MULTI] Button displays the still pictures starting at the top right corner of the screen.
- The quality of the pictures recorded in the Multi-Picture Mode is slightly inferior.
- To record the displayed Multi Mode still pictures onto the tape, press the Recording Start/Stop Button or the [PHOTO SHOT] Button.



Recording with Special Effects

(Digital Effects) (Continued)

■ Picture-in-Picture Mode

This function lets you display a small still picture inside the normal picture.

After setting [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu to [P-IN-P]... (➔ 41)

1 Press the [MENU] Button.

2 Turn the [PUSH] Dial to select [MULTI-PICTURES] and then press the [PUSH] Dial.
The [MULTI-PICTURES] Sub-Menu appears.

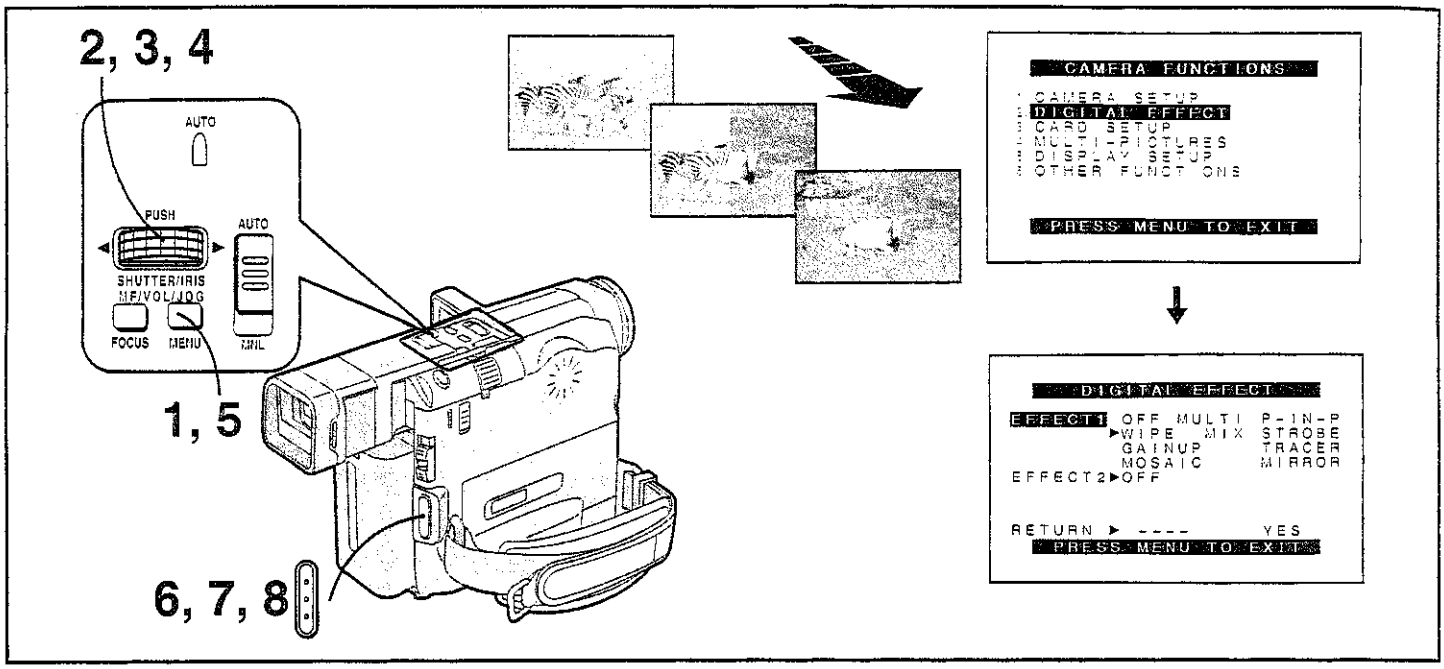
3 Turn the [PUSH] Dial to select [P-IN-P] and then press the [PUSH] Dial to select the desired position (❶, ❷, ❸ or ❹) where you want to insert the small picture.

4 Press the [MENU] Button to exit the menu.

5 Aim the Movie Camera at the scene that you want to capture and insert as a small picture and press the [P-IN-P] Button.
The small still picture appears inside the normal picture.

Making the Small Picture Disappear
Press the [P-IN-P] Button.

- It is not possible to use the Picture-in-Picture Mode when [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON].
- When you use the Camera Search Function or Recording Check Function, the small picture disappears. (However, it appears again after the Camera Search or Recording Check has finished.)
- It is possible to record the picture with the small picture inside in the Photoshot Mode. (However, it cannot be recorded in the Progressive Photoshot Mode.)
- Turning the Movie Camera off erases the small picture being displayed inside the normal picture.
- To record in the Picture-in-Picture Mode, press the Recording Start/Stop Button or the [PHOTO SHOT] Button.



Recording with Special Effects

(Digital Effects) (Continued)

■ Wipe Mode

It gradually replaces a still picture of the last recorded scene with the moving picture of the new scene, like drawing a curtain.

1 **Press the [MENU] Button.**

2 **Turn the [PUSH] Dial to select [DIGITAL EFFECT] and then press the [PUSH] Dial.**
The [DIGITAL EFFECT] Sub-Menu appears.

3 **Turn the [PUSH] Dial to select [EFFECT1].**

4 **Press the [PUSH] Dial to select [WIPE].**

5 **Press the [MENU] Button to exit the menu.**
The [WIPE] Indication appears.

6 **Press the Recording Start/Stop Button to start recording.**
The normal recording starts.

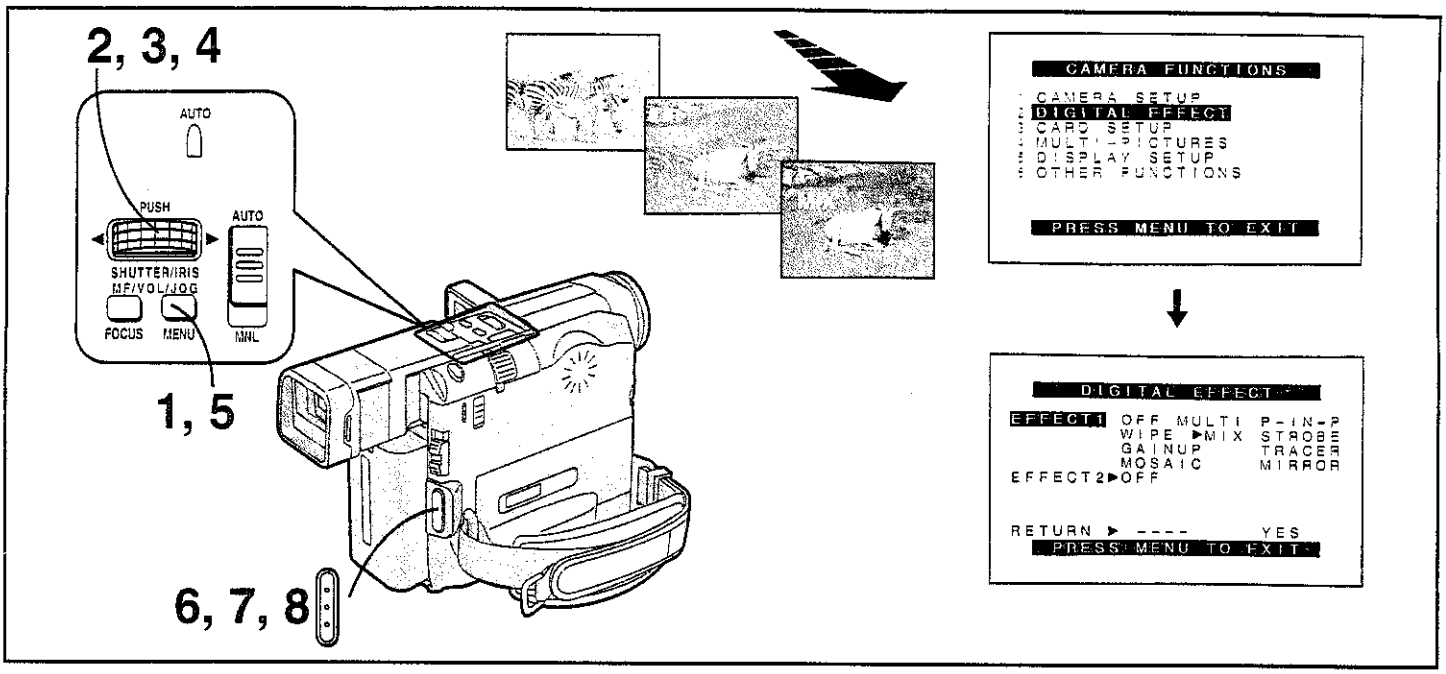
7 **Press the Recording Start/Stop Button to pause recording.**
The last picture is stored in memory.
The [WIPE] Indication changes to [WIPE].

8 **Press the Recording Start/Stop Button to start recording again.**
The last picture of the previous scene is gradually replaced by the new scene.

If you perform any of the following operations after performing Step 7, the picture stored in memory is erased and the Wipe Function cannot be used:

- Selecting any other mode on the [DIGITAL EFFECT] Sub-Menu.
- Using the Camera Search Function.

- Instead of performing the Wipe from the last recorded picture, you can store a still picture in memory by pressing the [PHOTO SHOT] Button after Step 5 above and then perform Step 8.



Recording with Special Effects

(Digital Effects) (Continued)

■ Mix Mode

It gradually fades out a still picture of the last recorded scene while fading in the moving picture of the new scene.

1 **Press the [MENU] Button.**

2 **Turn the [PUSH] Dial to select [DIGITAL EFFECT] and then press the [PUSH] Dial.**
The [DIGITAL EFFECT] Sub-Menu appears.

3 **Turn the [PUSH] Dial to select [EFFECT1].**

4 **Press the [PUSH] Dial to select [MIX].**

5 **Press the [MENU] Button to exit the menu.**
The [MIX] Indication appears.

6 **Press the Recordng Start/Stop Button to start recording.**
The normal recording starts.

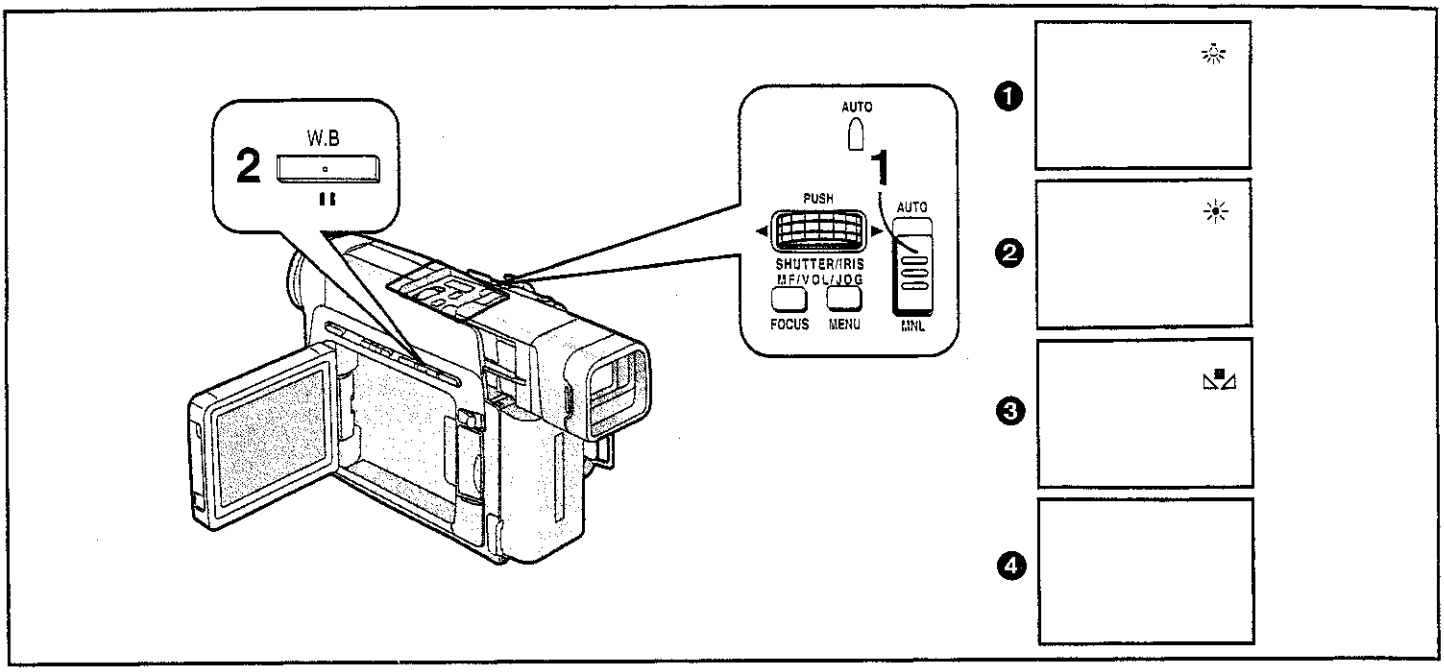
7 **Press the Recording Start/Stop Button to pause recording.**
The last picture is stored in memory.
The [MIX] Indication changes to [MIX].

8 **Press the Recording Start/Stop Button to start recording again.**
The last picture gradually fades out while the new scene fades in.

If you perform any of the following operations after performing Step 7, the picture stored in memory is erased and the Mix Function cannot be used:

- Selecting any other mode on the [DIGITAL EFFECT] Sub-Menu.
- Using the Camera Search Function.

- Instead of performing the Mix from the last recorded picture, you can store a still picture in memory by pressing the [PHOTO SHOT] Button after Step 5 above and then perform Step 8.



Recording with Natural Colours

(White Balance)

This Movie Camera automatically adjusts the white balance to ensure that the pictures are recorded with natural colours. For certain types of subjects and lighting conditions, however, this Auto White Balance Adjustment Mode may not be able to ensure natural colours **(➔ 111, 112)**. In these cases, you can select either one of the 3 preset modes explained below (indoor, outdoor, or the last manually adjusted white balance setting), or you can manually adjust the white balance **(➔ 49)**.

1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

2 **Press the White Balance [W.B] Button.**
Repeatedly press the [W.B] Button to select the desired White Balance Mode.

The modes change in the following order:

❶ Indoor Mode
(recording under incandescent lamp) (☼)

❷ Outdoor Mode (☀)

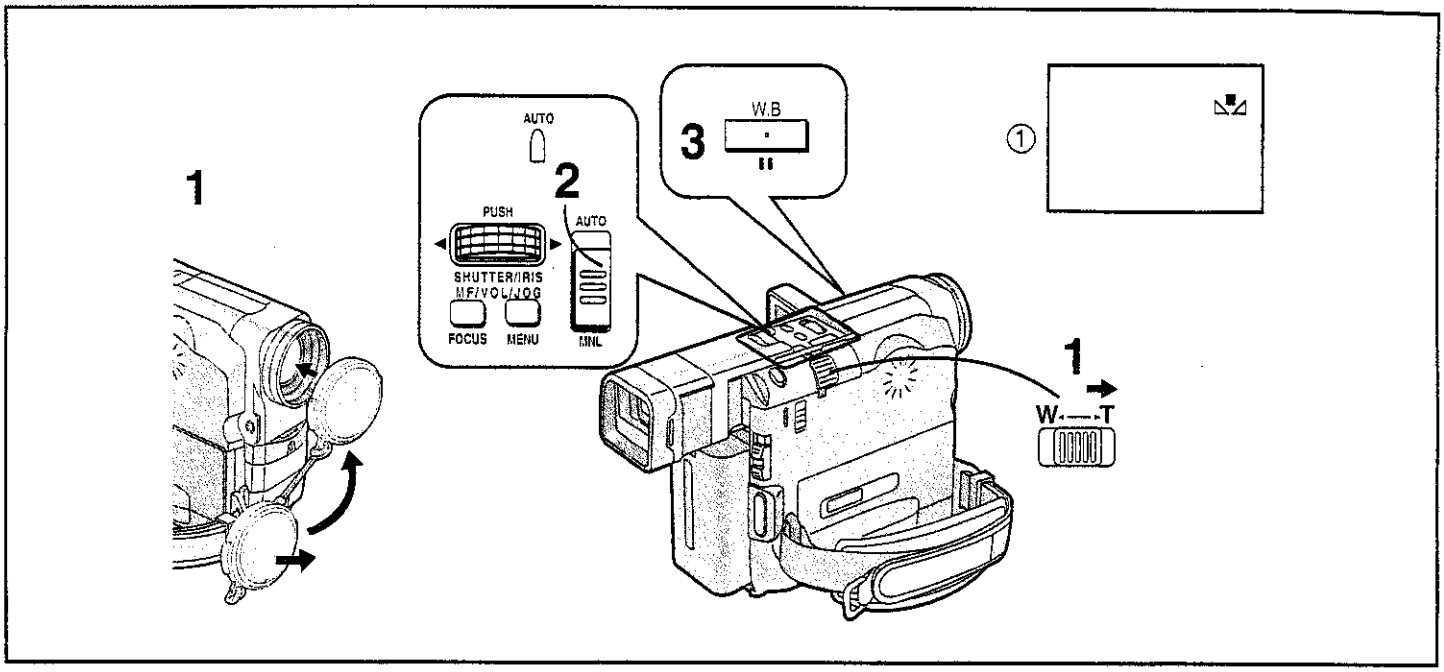
❸ Last manually adjusted White Balance setting (▣)
(➔ 49)

❹ Automatic White Balance Adjustment (no indication)

- Be sure to remove the Lens Cap before setting the [OFF/ON/MODE] Switch to [ON]. If the Lens Cap is still attached to the Lens when the [CAMERA] Lamp lights, the automatic white balance adjustment may not be precise.
- If you have set [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu to [GAINUP], or if you have set [EFFECT2] to [SEPIA] or [B/W], it is not possible to change the white balance.
- To change the white balance mode, the Movie Camera must be set within the optical zoom range (1×–15×). If you try to adjust it in the digital zoom range, the [▣] Indication flashes.

Returning to the Auto White Balance Adjustment Mode

Press the [W.B] Button repeatedly until none of the White Balance Mode Indications ([☼], [☀], [▣]) are displayed any more. Or, set the Mode Selector Switch to [AUTO].



Adjusting the White Balance Manually

Use the Manual White Balance Adjustment Mode for all types of lighting outside the range ❶ (➔ 112), as the Auto White Balance Adjustment Mode can only ensure natural colours for the types of lighting within that range. For optimum results under almost any type of lighting, we recommend that you adjust the white balance manually for each new scene.

1 Attach the Lens Cap and zoom in until the entire screen becomes white.

2 Set the Mode Selector Switch to [MNL].
The [MNL] Indication appears.

3 Keep the [W.B] Button pressed until the [▣◿] Indication ① stops flashing and remains lit.

In the Following Cases, the [▣◿] Indication Flashes:

When you recall the last manually adjusted white balance setting

- The flashing indication tells you that the white balance setting you last adjusted is still maintained. This setting is kept until you adjust the white balance again.

When you are trying to adjust the white balance in a dark place

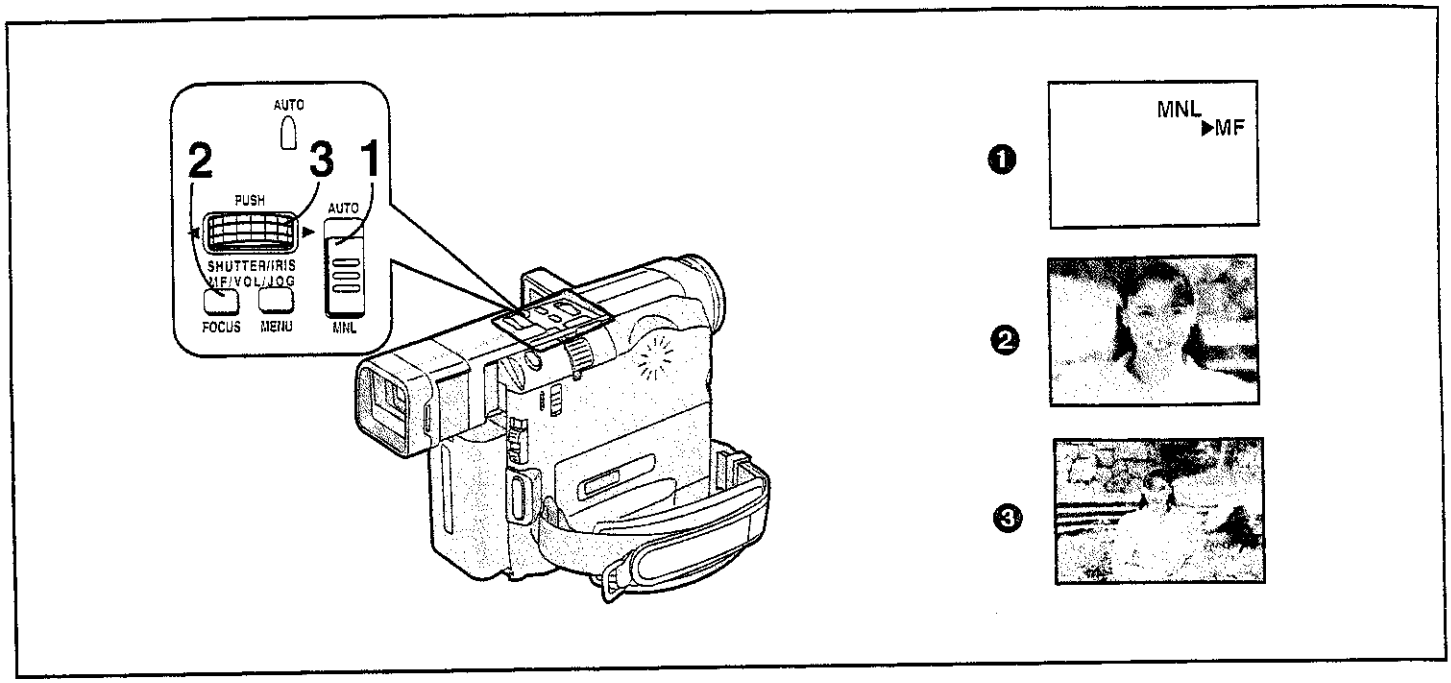
- Under weak illumination, precise manual white balance adjustment may not be possible. In this case, set the Mode Selector Switch to [AUTO] to record with automatic white balance adjustment.

During manual adjustment of the white balance

- The [▣◿] Indication flashes while the white balance is being adjusted. When the white balance adjustment is finished, the [▣◿] Indication stops flashing and remains lit.
- It is not possible to manually adjust the white balance or select any of the preset white balance modes when you have zoomed to 15× or higher (digital zoom range), when [EFFECT1] on the [DIGITAL EFFECT] Sub-Menu is set to [GAINUP] and when [EFFECT2] is set to [SEPIA] or [B/W].
- We recommend that you adjust the white balance anew whenever there is a change in the recording situation.

Returning to the Automatic White Balance Adjustment Mode

Press the [W.B] Button repeatedly until none of the White Balance Mode Indications ([☼], [☀], [▣◿]) are displayed any more. Or, set the Mode Selector Switch to [AUTO].



Focusing on the Subject Manually

(Manual Focus)

This makes it possible to adjust the focus manually for subjects and recording situations for which automatic focusing is not precise.

1 **Set the Mode Selector to [MNL].**
The [MNL] Indication appers.

2 **Press the [FOCUS] Button.**
The [▶MF] Indication ❶ appears.
MF: Manual Focus Mode

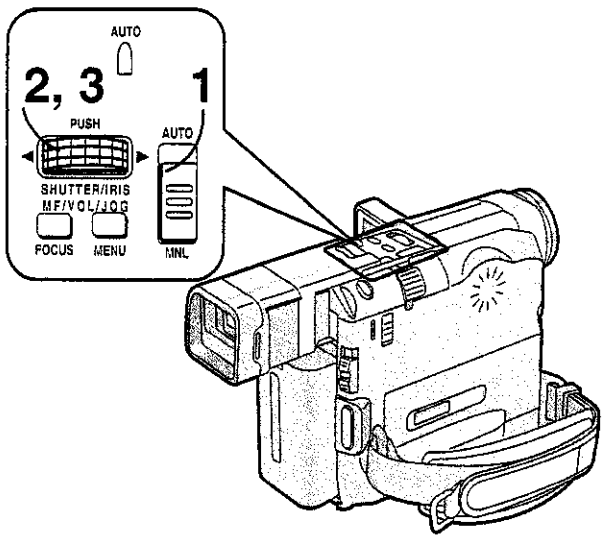
3 **Turn the [PUSH] Dial until the subject is sharp.**

Returning to the Automatic Focusing Mode

Press the [FOCUS] Button to make the [▶MF] Indication disappear. Or, set the Mode Selector Switch to [AUTO].

Hint for Manual Focus Adjustment

- If you adjust the focus in the wide-angle setting, the subject may go out of focus when you enlarge it. Therefore, enlarge the subject ❷ before you adjust the focus, so that the picture remains focused when you zoom out ❸.
- If you want to adjust the focus manually after having adjusted the shutter speed (➔ 51) or the iris (➔ 52), be sure to press the [FOCUS] Button to make the [▶MF] Indication appear, even if the [MF] Indication is displayed.



Adjusting the Shutter Speed Manually

To achieve special creative effects or to cope with special lighting situations or fast-action scenes, you can adjust the shutter speed manually.

1 **Set the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

2 **Press the [PUSH] Dial.**
The Shutter Speed Indication appears.
You can change between the Shutter Speed Indication and the Iris (F Number) **(➔ 52)** Indication by repeatedly pressing the [PUSH] Dial.

3 **Turn the [PUSH] Dial to adjust the shutter speed.**

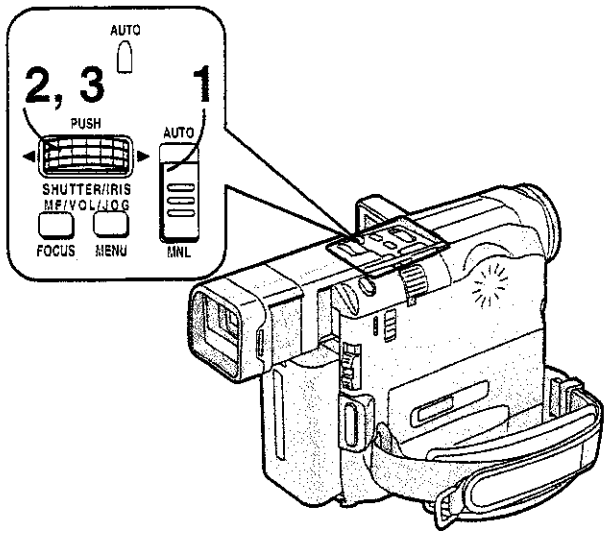
Range of Shutter Speed Adjustment

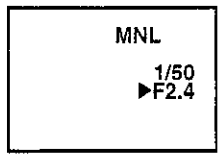
1/50–1/8000 s
The standard shutter speed is 1/50 s.
The nearer to [1/8000] a setting you select, the faster the shutter speed becomes.

- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON], the range of selectable shutter speeds is limited from 1/50 s to 1/500 s.
- The playback picture of subjects lit by strong lights or with much light reflection may contain vertical streaks of light.
- During normal playback, the scene-to-scene transitions may not be smooth.
- Avoid recording under fluorescent lamps, mercury lamps or natrium lamps, as they can cause unstable colours and brightness of the playback picture.
- When [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [AUTO], and the shutter speed is set to 1/750 s or faster, the Progressive Photoshot Mode cannot be used.
- When using the Gain-up Mode **(➔ 39)** or any of the Programme AE Modes **(➔ 37)**, it is not possible to adjust the shutter speed. If the shutter speed was manually adjusted, this setting is cancelled.
- Adjust the shutter speed according to the recording situation.

Returning to the Normal Shutter Speed

Set the Mode Selector Switch to [AUTO].





Adjusting the Iris (F Number) Manually

To achieve special creative effects or to cope with special lighting situations, you can adjust the iris (F number) manually.

1 **Slide the Mode Selector Switch to [MNL].**
The [MNL] Indication appears.

2 **Press the [PUSH] Dial twice.**
The [▶F] Indication appears.
You can change between the Iris (F Number) Indication and the Shutter Speed Indication by repeatedly pressing the [PUSH] Dial.

3 **Turn the [PUSH] Dial to adjust the iris.**

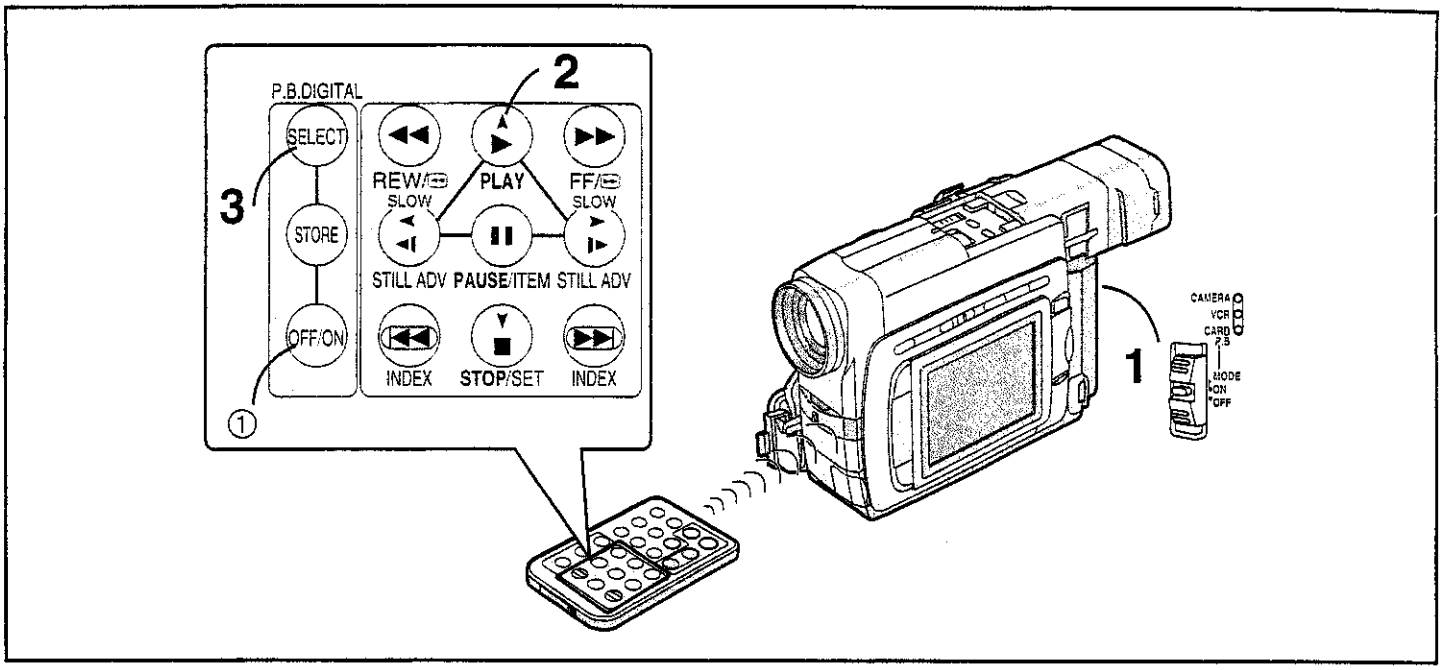
Range of Iris Adjustment

CLOSE (Closed)→F16...F2.0→OP+0 dB (Opened)...OP+18 dB
The nearer to [CLOSE] a value you select, the darker the picture becomes.
The nearer to [OP+18 dB] a value you select, the brighter the picture becomes.
The figures with +dB show the Gain-up value. If you increase the value too much, the picture quality deteriorates.

Returning to the Normal Iris Value (F Number)

Press the [PUSH] Dial one time to make the [▶F] Indication disappear. Or set the Mode Selector Switch to [AUTO].

- Increasing the Gain-up value also increases the graininess of the picture.
- Depending on the zoom magnification, some iris values may not be displayed.
- Manually adjusting the shutter speed after performing manual iris adjustment changes the iris back to automatic adjustment. Therefore, if you want to adjust both the shutter speed and iris manually, be sure to adjust the shutter speed first. **(➔ 51)**
- Manual iris adjustment is not possible when [PROG.AE] on the [CAMERA SETUP] Sub-Menu is set to any setting other than [OFF]. **(➔ 37)**



Playing Back with Special Effects

(Playback Digital Effects)

There are 11 different modes available for adding special digital picture effects to your recordings during playback. They are identical to the Digital Effects 1 and 2 **(➔ 39, 40)** that can be used during recording.

❶ MULTI ❷ WIPE ❸ MIX
❹ STROBE ❺ NEGA ❻ SEPIA
❼ B/W ❽ TRACER ❾ SOLARI
❿ MOSAIC ⓫ MIRROR

1 Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

2 Press the Play Button [▶].

3 Press the [SELECT] Button on the Remote Controller to select the desired digital effect.
Repeatedly pressing the [SELECT] Button changes the selelcted digital effect in the order ❶ to ⓫.
Selecting a digital effect is also possible by setting [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu of [VCR FUNCTIONS] Main-Menu to the desired effect.

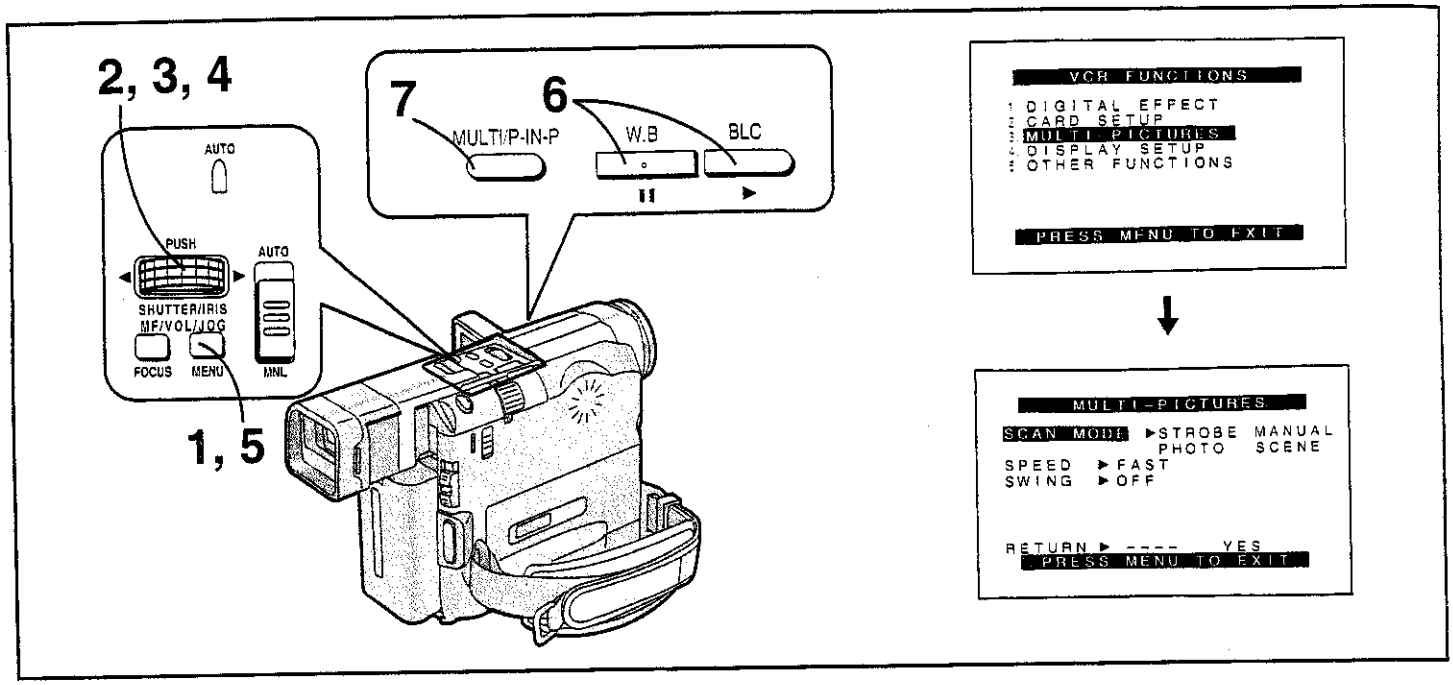
Suspending the Playback Digital Effect Temporarily

You can suspend and re-activate the digital effect by repeatedly pressing the [OFF/ON] Button ①. Suspending a digital effect is also possible by setting [EFFECT] on the [DIGITAL EFFECT] Sub-Menu to [OFF], and later to [ON] to re-activate it. When the digital effect is temporarily suspended, the indication of the selected effect flashes.

Cancelling the Digital Effect

Press the [SELECT] Button on the Remote Controller to make the displayed digital effect indication disappear. Or, set [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu to [OFF].

- The signal of the picture with a digital effect added during playback cannot be output from the DV Terminal **(➔ 6)** or the Digital Still Picture Terminal. **(➔ 85)**
- In the VCR Mode, the Wipe Function and the Mix Function can only be operated with the Remote Controller.
- It is not possible to use the Wipe or Mix Function during playback of an unrecorded part of the tape.
- It is not possible to use the Mirror Mode of the Digital Effects and the Playback Zoom Function at the same time. **(➔ 60)**



Playing Back with Special Effects

(Playback Digital Effects) (Continued)

■ Strobe Multi-Picture Mode

This function captures and displays a sequence of 9 small still pictures from the playback picture. This is very convenient for motion analysis of sports action, animal studies, etc.

After setting [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu to [MULTI]... (➔ 53)

1 Press the [MENU] Button.

2 Turn the [PUSH] Dial to select [MULTI-PICTURES] and then press the [PUSH] Dial.
The [MULTI-PICTURES] Sub-Menu appears.

3 Turn the [PUSH] Dial to select [SCAN MODE] and then press the [PUSH] Dial to select [STROBE].

4 Turn the [PUSH] Dial to select [SPEED] and then press the [PUSH] Dial to select the desired strobe speed.
At the [FAST] setting, the sequence of 9 still pictures is captured within approximately 1 second, at [NORMAL] within approximately 2 seconds, and at [SLOW] within approximately 3 seconds.

5 Press the [MENU] Button to exit the menu.

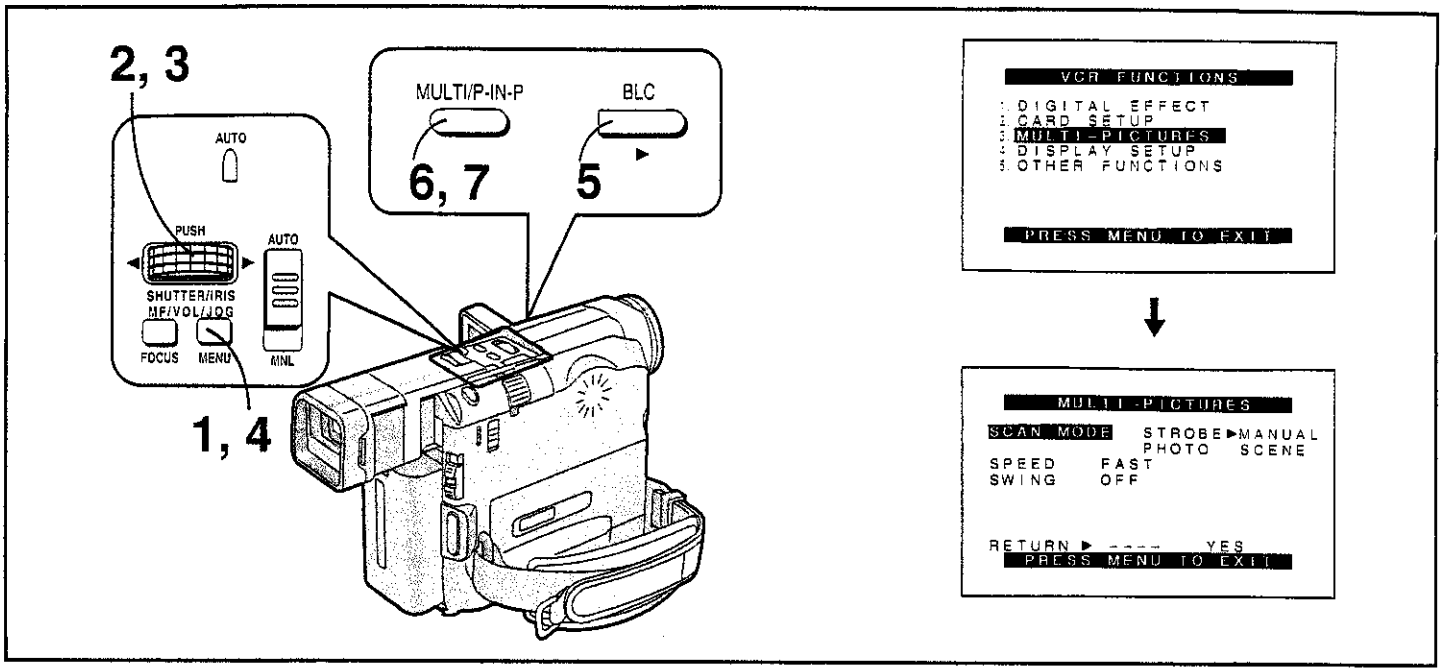
6 Start playback, and when you reach the scene that you want to capture and display in the Strobe Multi-Picture Mode, pause the picture.

7 Press the [MULTI] Button.
A sequence of 9 still pictures appears and the tape stops.

Swing Mode
If you set [SWING] on the [MULTI-PICTURES] Sub-Menu to [ON], the intervals at which the still pictures are captured are longer at the beginning and end than in the middle of the swing strobe period.

Making the Multi-Pictures Disappear
Press the [MULTI] Button.

Displaying the Multi-Pictures Again
Press the [MULTI] Button for more than 1 second.



Playing Back with Special Effects

(Playback Digital Effects) (Continued)

■ Manual Multi-Picture Mode

With this function, you can capture up to 9 pictures from different scenes and display them together as small still pictures on the same screen. This lets you put together an assortment of different scenes in a single picture.

After setting [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu to [MULTI]... (➔ 53)

1 Press the [MENU] Button.

2 Turn the [PUSH] Dial to select [MULTI-PICTURES] and then press the [PUSH] Dial.
The [MULTI-PICTURES] Sub-Menu appears.

3 Turn the [PUSH] Dial to select [SCAN MODE] and then press the [PUSH] Dial to select [MANUAL].

4 Press the [MENU] Button to exit the menu.

5 Press the Play Button [▶].

6 Press the [MULTI] Button once to activate the Multi-Picture Mode.

7 Press the [MULTI] Button at the scene that you want to capture and display in the Manual Multi-Picture Mode.
When 9 still pictures are displayed, the tape stops.

Making All Multi-Pictures Disappear

After displaying 9 pictures, it is possible to make them disappear in one go by pressing the [MULTI] Button.

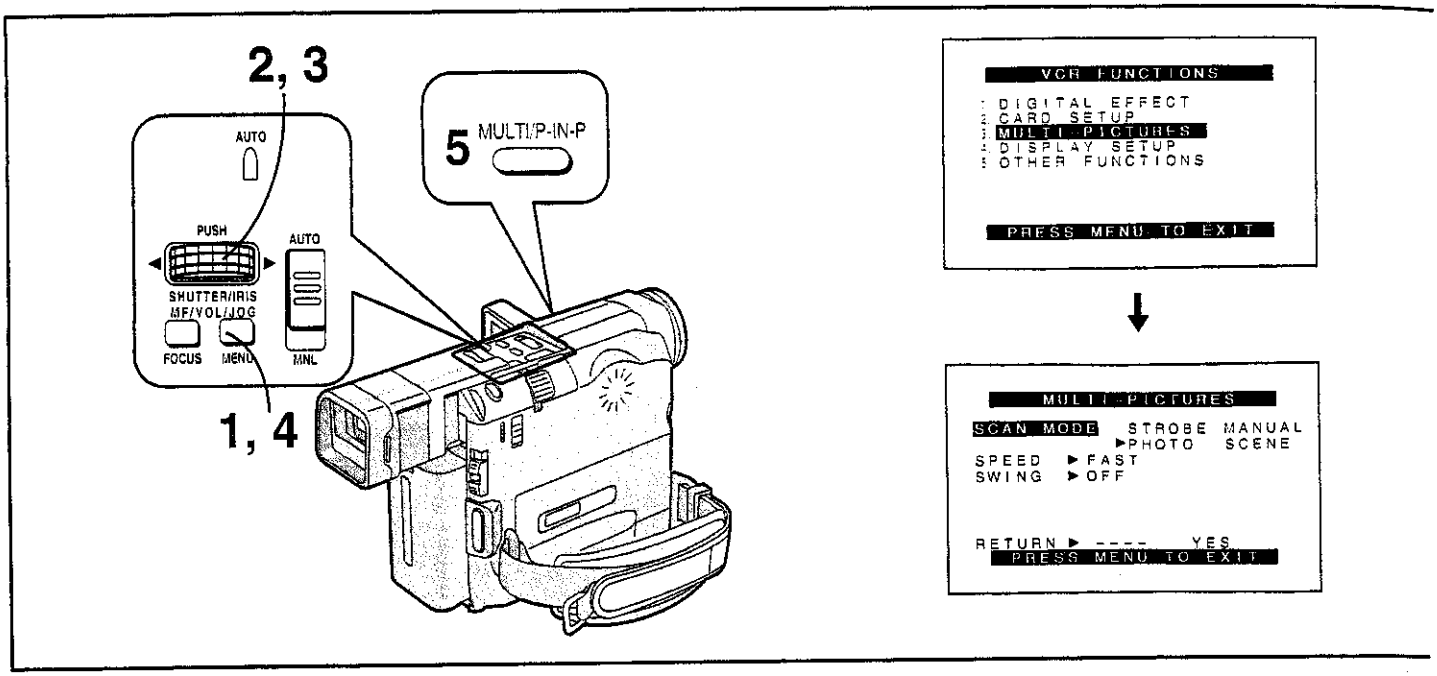
Displaying the Multi-Pictures Again

Press the [MULTI] Button for more than 1 second.

Erasing the Multi-Pictures One by One

While the still pictures are displayed, press the [MULTI] Button for more than 1 second.

- This erases the last captured picture. Keeping the [MULTI] Button pressed erases the pictures continuously.
- After you have erased the still pictures one by one, it is not possible to display them again.



Playing Back with Special Effects

(Playback Digital Effects) (Continued)

■ Index Multi-Picture Mode

With this function, you can automatically capture up to 9 smal still pictures of scenes or Photoshot pictures marked with index signal and display them in a single picture.

After setting [EFFECT SELECT] on the [DIGITAL EFFECT Sub-Menu to [MULTI]... (➔ 53)

1 **Press the [MENU] Button.**

2 **Turn the [PUSH] Dial to select [MULTI-PICTURES] and then press the [PUSH] Dial.**
The [MULTI-PICTURES] Sub-Menu appears.

3 **Turn the [PUSH] Dial to select [SCAN MODE] and then press the [PUSH] Dial to select [PHOTO] or [SCENE].**

4 **Press the [MENU] Button to exit the menu.**

5 **Press the [MULTI] Button.**
9 pictures marked with index signals are captured in forward direction from the tape position at which the [MULTI] Button was pressed, and the tape then stops. (If there are less than 9 pictures marked with index signals, the tape stops at its end.)

Making the Multi-Pictures Disappear
Press the [MULTI] Button.

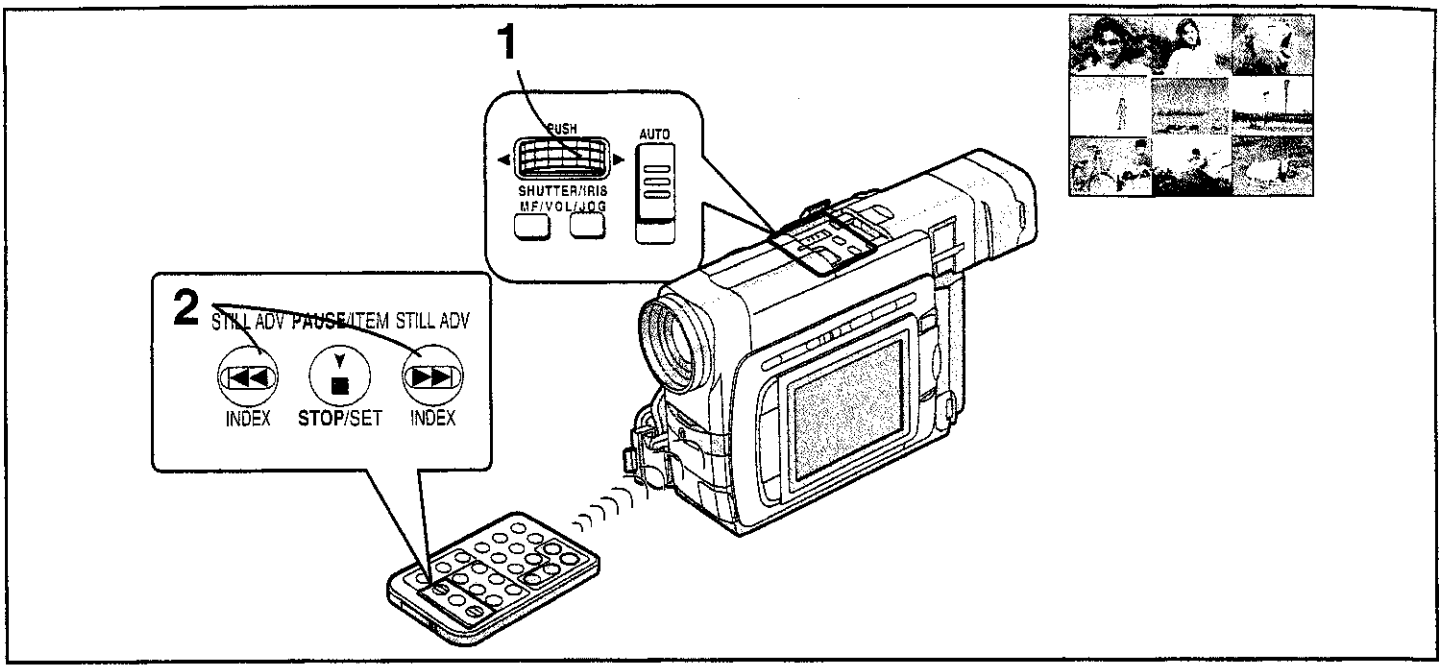
Displaying the Multi-Pictures Again
Press the [MULTI] Button for more than 1 second.

There Are Two Different Types of Index Signals:
In Step 3 above, select [PHOTO] or [SCENE] as follows:
[PHOTO]: To search for still pictures marked with photoshot index signal and capture and display them.
[SCENE]: To search for scenes marked with scene index signal and capture and display them as still pictures.

- The index signals are recorded automatically during recording. **(➔ 33)**

Notes for Using the Multi-Picture Mode

- The playback multi-pictures cannot be output from the DV Terminal **(➔ 6)** or the Digital Still Pictures Terminal **(➔ 85)**.
- The quality of the pictures displayed in the Multi-Picture Mode is slightly inferior.
- If a picture is being input via the DV Terminal, it is not possible to use the Multi-Picture Mode. Disconnect the source unit from the DV Terminal.
- If you switch the Movie Camera from the Index Multi-Picture Mode over to the Camera Mode, the setting of [SCAN MODE] on the [MULTI-PICTURES] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu is automatically set to [STROBE].



Playing Back with Special Effects

(Playback Digital Effects) (Continued)

■ Multi-Picture Search

This function lets you search for the tape position of a desired still picture displayed in the Multi-Picture Mode.

1 After displaying the still pictures in the Multi-Picture Mode, turn the [PUSH] Dial to select a picture whose tape position you want to locate.

The selected picture is marked with a flashing red frame.

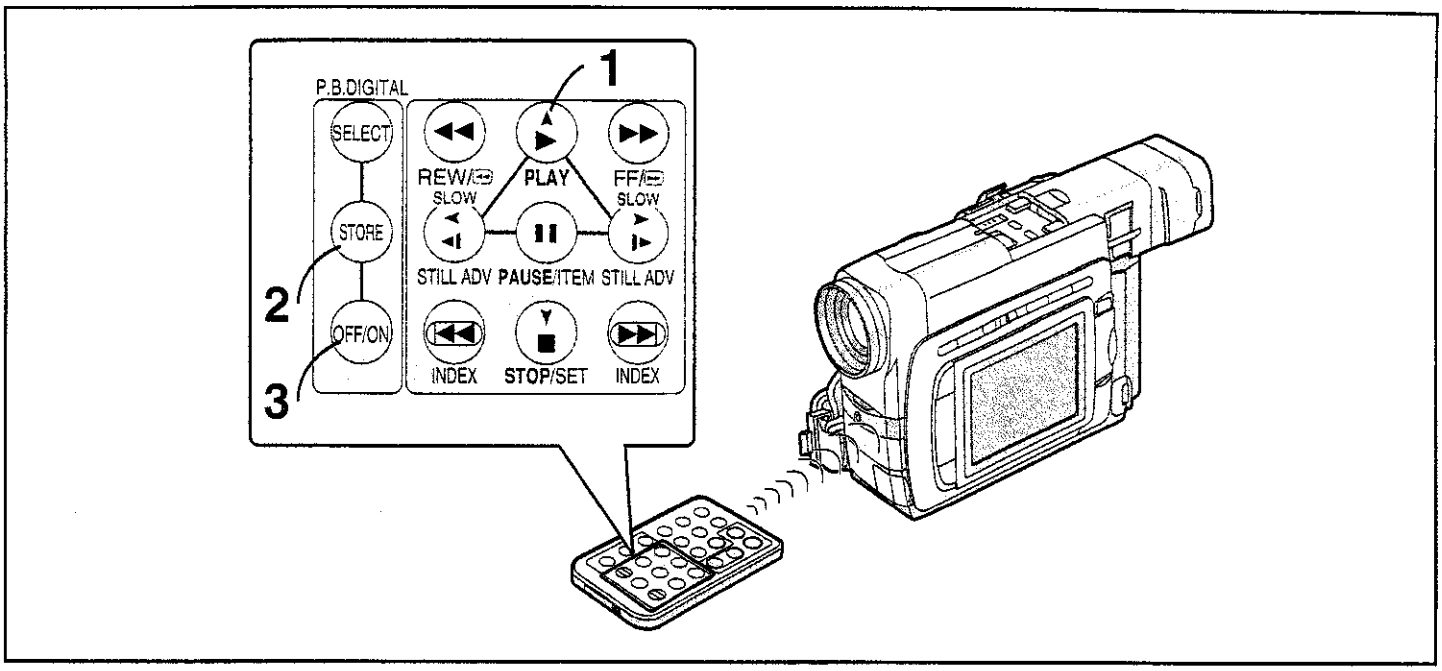
2 Press the Index Button [⏮] or [⏭] on the Remote Controller.

The tape stops at the beginning of the selected scene and the Movie Camera is in the Still Playback Mode.

Displaying the Still Pictures in the Multi-Picture Mode Again

Press the [MULTI] Button for more than 1 second.

- In case of the pictures displayed in the Manual Multi-Picture Mode (➔ 55), use the Multi-Picture Search Function after displaying all 9 pictures.
- In case of the pictures displayed in the Index Multi-Picture Mode (➔ 56), the Multi-Picture Search Function can be used even if less than 9 pictures are displayed.
- If you use a video printer equipped with a 5-pin editing socket, you can print the picture that you selected in Step 1.
- The tape positions of the pictures located with the Multi-Picture Search Function are subject to some imprecision.



Playing Back with Special Effects

(Playback Digital Effects) (Continued)

■ Wipe Function and Mix Function

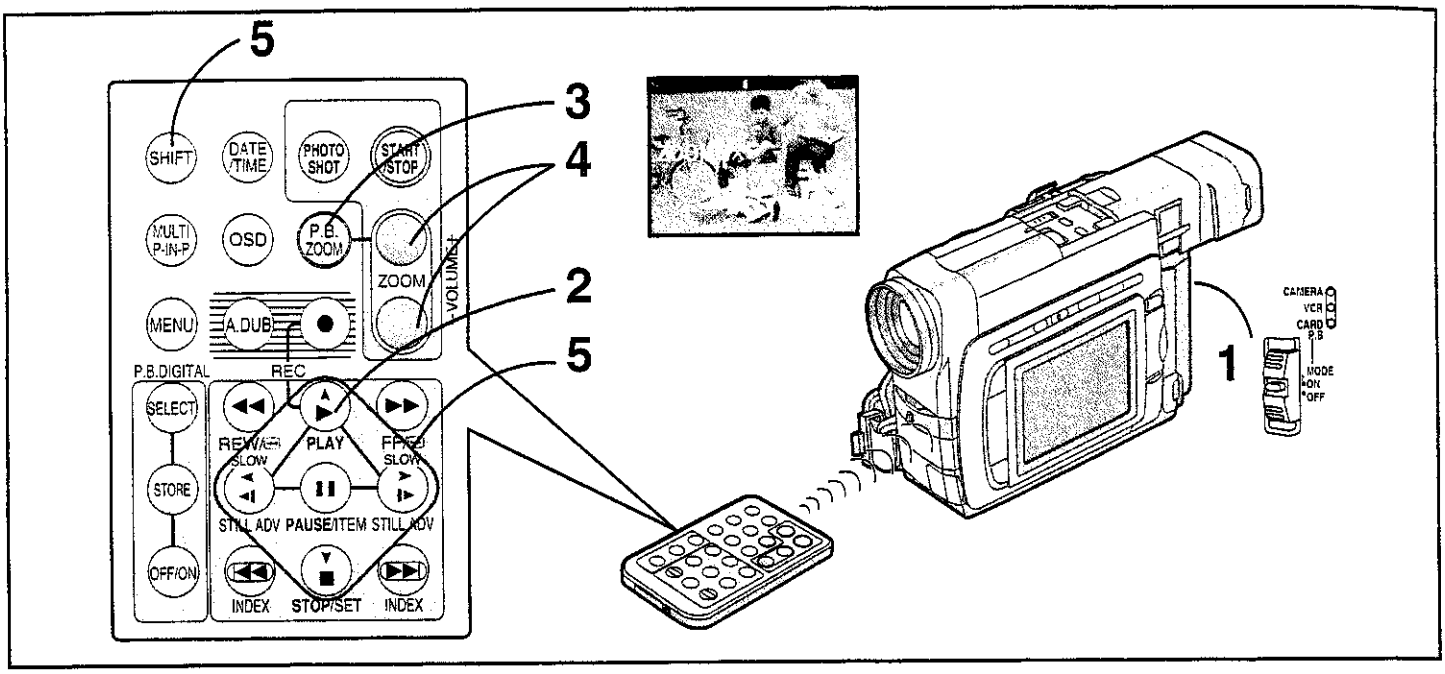
After setting [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu to [WIPE] or [MIX]... (→ 53)

1 Press the [▶] Button to start playback.

2 Press the [STORE] Button at the moment that you want to store as still image in memory.
The [WIPE] or [MIX] Indication appears and the picture is stored in memory.

3 Press the [OFF/ON] Button at the scene at which you want to use a Wipe or Mix effect.
The scenes change with a Wipe or Mix effect.

- Operating the Wipe Function and the Mix Function during playback is only possible with the Remote Controller.
- It is not possible to add a Wipe or Mix effect during playback of an unrecorded part on the tape.
- If you press the [OFF/ON] Button while the Wipe or Mix is being performed, the effect is paused at that point. If you press the [OFF/ON] Button again, the effect resumes.



Enlarging the Playback Picture

(Playback Zoom)

With this function, you can enlarge a part of the picture by up to 10 times during playback.

1 Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

2 Press the Play Button [▶].

3 Press the Playback Zoom Button [P.B.ZOOM] on the Remote Controller.

The center part of the picture is enlarged about 2 times.

Changing the Zoom Magnification

4 Press the [W] or [T] Zoom Button on the Remote Controller to change the magnification.

You can increase the magnification up to 10×.

Changing the Part of the Picture to be Enlarged

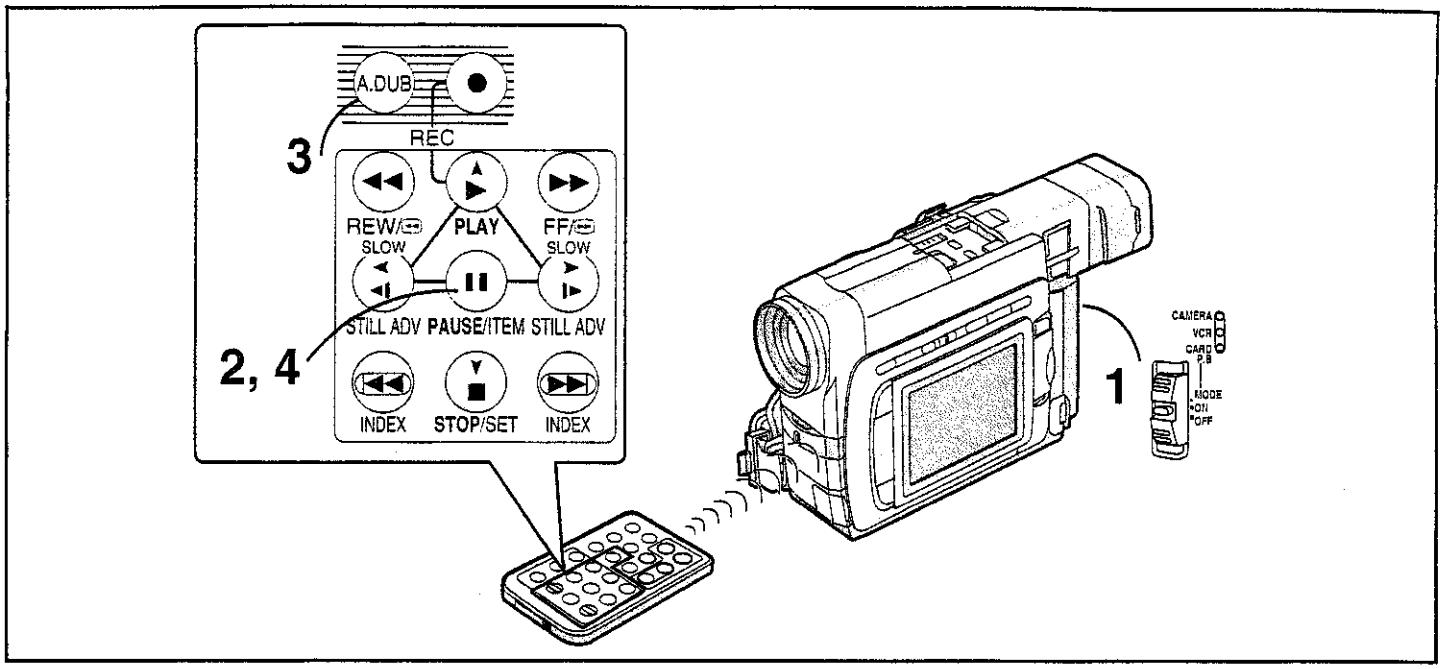
5 While pressing the [SHIFT] Button on the Remote Controller, press the Arrow Button (▲, ◀, ▶, ▼) for the direction in which you want to shift the enlarged part of the picture.

When you stop playback, the position of the part of the picture to be enlarged is automatically reset to the centre.

Cancelling the Playback Zoom Function

Press the [P.B.ZOOM] Button on the Remote Controller.

- In the Playback Zoom Mode, it is not possible to adjust the sound volume.
- Turning the Movie Camera off or switching it from the VCR Mode over to the Camera Mode automatically cancels the Playback Zoom Mode.
- Even while you are using the Playback Zoom Function, the picture output from the DV Terminal (➔ 6) and the Digital Still Picture Terminal (➔ 85) is not enlarged.
- The more the picture is enlarged, the more its picture quality deteriorates.
- If you press the [MULTI] Button in the Playback Zoom Mode, the zoom magnification becomes 1×.
- It is not possible to use the Mirror Mode of the Digital Effects and the Playback Zoom Function at the same time. (➔ 53)



Adding New Sound on a Recorded Cassette (Audio Dubbing)

To perform audio dubbing, the Remote Controller is necessary.
You can add music or narration on a recorded cassette.

- If you perform audio dubbing onto a tape that was recorded with [AUDIO REC] on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu set to [16bit], the original sound is erased. (If you intend to perform audio dubbing but also want to keep the original sound, be sure to set [AUDIO REC] to [12bit] before making the original recording.)
- It is not possible to perform audio dubbing onto recordings made in the LP Mode. **(➔ 12)**

1 Insert the recorded cassette and slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.
Make sure that the erasure prevention slider of the cassette is set to [REC].

2 At the point from which you want to insert the new sound, switch the Movie Camera over to the Still Playback Mode.
Using Cue Playback, Review Playback or Variable Speed Playback makes it easy to search for this point.

3 Press the [A.DUB] Button on the Remote Controller.

4 Press the Pause Button [❚❚] on the Remote Controller to start audio dubbing.

Stopping Audio Dubbing

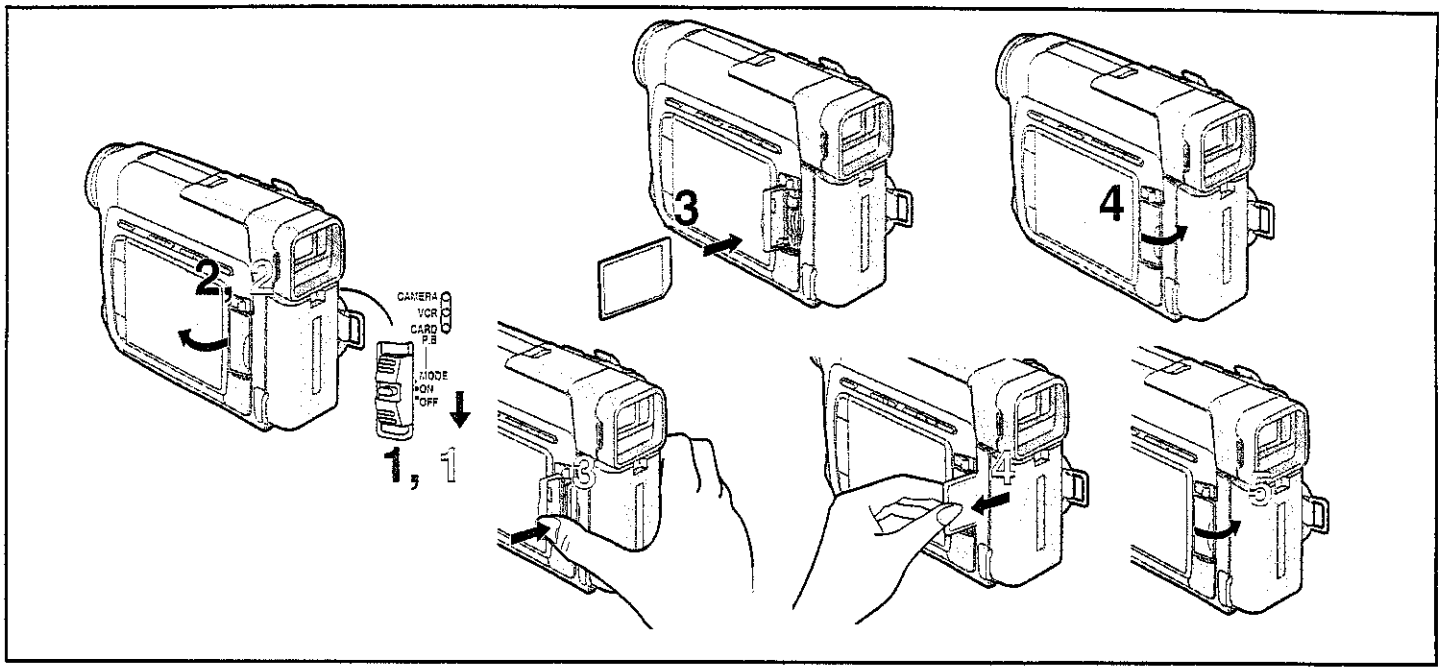
Press the Pause Button [❚❚] on the Remote Controller.
The Movie Camera is again in the Still Playback Mode.

Playing Back the Sound Recorded with Audio Dubbing

Depending on the setting selected for [12bit AUDIO] on the [OTHER FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu, the sound added with audio dubbing and the original sound are played back as follows:

ST1: The original sound alone is played back.
ST2: The dubbed sound alone is played back.
MIX: The original sound and the sound added with audio dubbing are played back together.

- It is not possible to perform audio dubbing on an unrecorded part of the tape.
- If there was an unrecorded part on the tape when audio dubbing was performed, picture and sound distortion occur at that tape portion during playback.
- If you reset the Tape Counter to zero at the point where you want the audio dubbing to end and turn on the Memory Stop Function (➔ 114), the audio dubbing automatically stops when the tape reaches that point.



Using the MultiMediaCard

You can use the supplied MultiMediaCard to record still pictures onto it, even without a cassette inserted. You can also take favourite scenes recorded on the cassette and copy them as still pictures onto the MultiMediaCard, or you can copy still pictures recorded on the MultiMediaCard onto the cassette.

Loading the MultiMediaCard

Be sure to turn the Movie Camera off before loading the MultiMediaCard.

1 **Set the [OFF/ON/MODE] Switch to [OFF].**

2 **Slide the Card Slot Cover in the direction of the arrow to open it.**

3 **Hold the MultiMediaCard with its cut-off corner facing down and toward the Movie Camera and insert it straight until it stops.**

4 **Close the Card Slot Cover securely.**

Taking Out the MultiMediaCard

Be sure to turn the Movie Camera off before taking out the MultiMediaCard.

1 **Set the [OFF/ON/MODE] Switch to [OFF].**

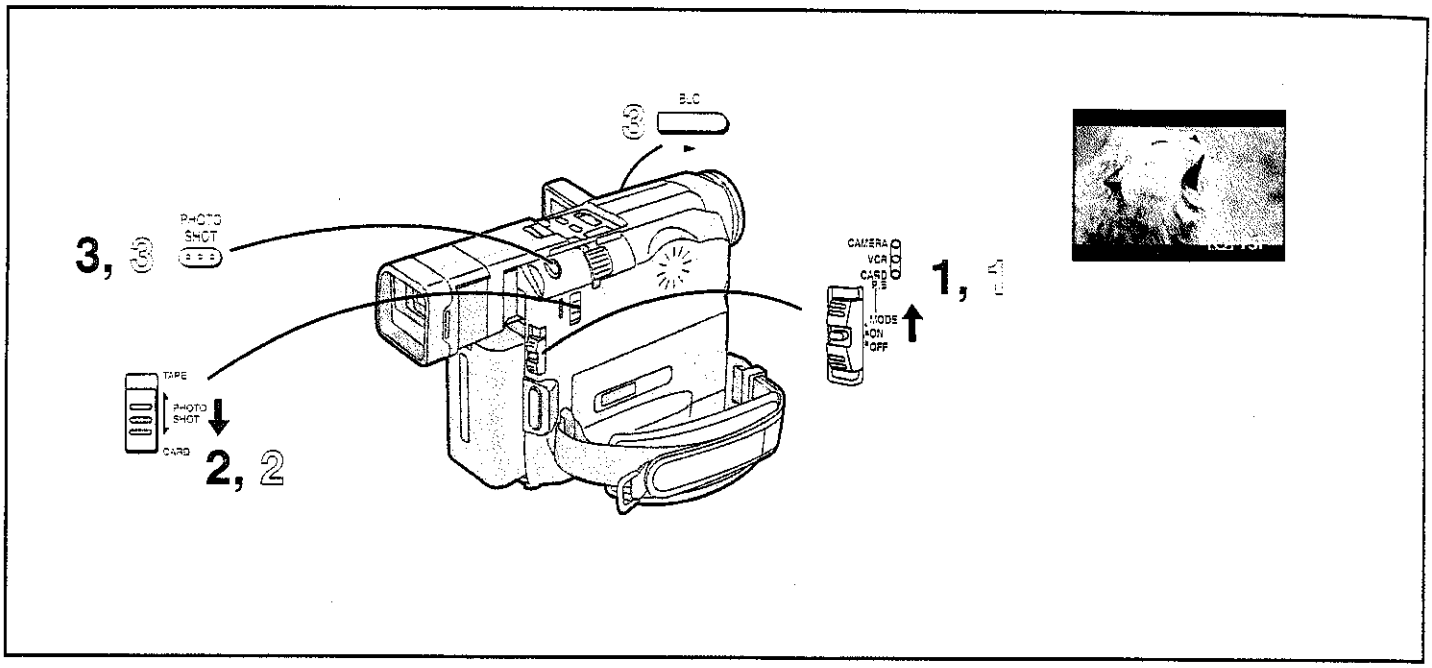
2 **Slide the Card Slot Cover in the direction of the arrow to open it.**

3 **Push the MultiMediaCard on its centre.**

4 **Pull the MultiMediaCard straight out.**

5 **Close the Card Slot Cover securely.**

- Do not turn the Movie Camera off while the MultiMediaCard is being read, such as during Card Photoshot recording, copying pictures onto the cassette, erasing pictures on the MultiMediaCard or using the Multi-Picture Function in the Card Playback Mode.
  This could damage the MultiMediaCard or recorded contents, and even cause malfunction of the Movie Camera.
- Before closing the Card Slot Cover, be sure to confirm that the MultiMediaCard is inserted correctly.



Recording Still Pictures on the MultiMediaCard (Card Photoshot)

You can record still picture onto the MultiMediaCard both through the Movie Camera's lens and from scenes that you have already recorded on the cassette.

- Sound is not recorded.
- The Shutter Effect (➔ 20) cannot be used.

Recording Still Pictures on the MultiMediaCard in the Camera Mode:

1 **Set the [OFF/ON/MODE] Switch to [ON].**
The [CAMERA] Lamp lights.

2 **Slide the [TAPE/CARD] Selector to [CARD].**

3 **Press the [PHOTO SHOT] Button at the scene that you want to record.**

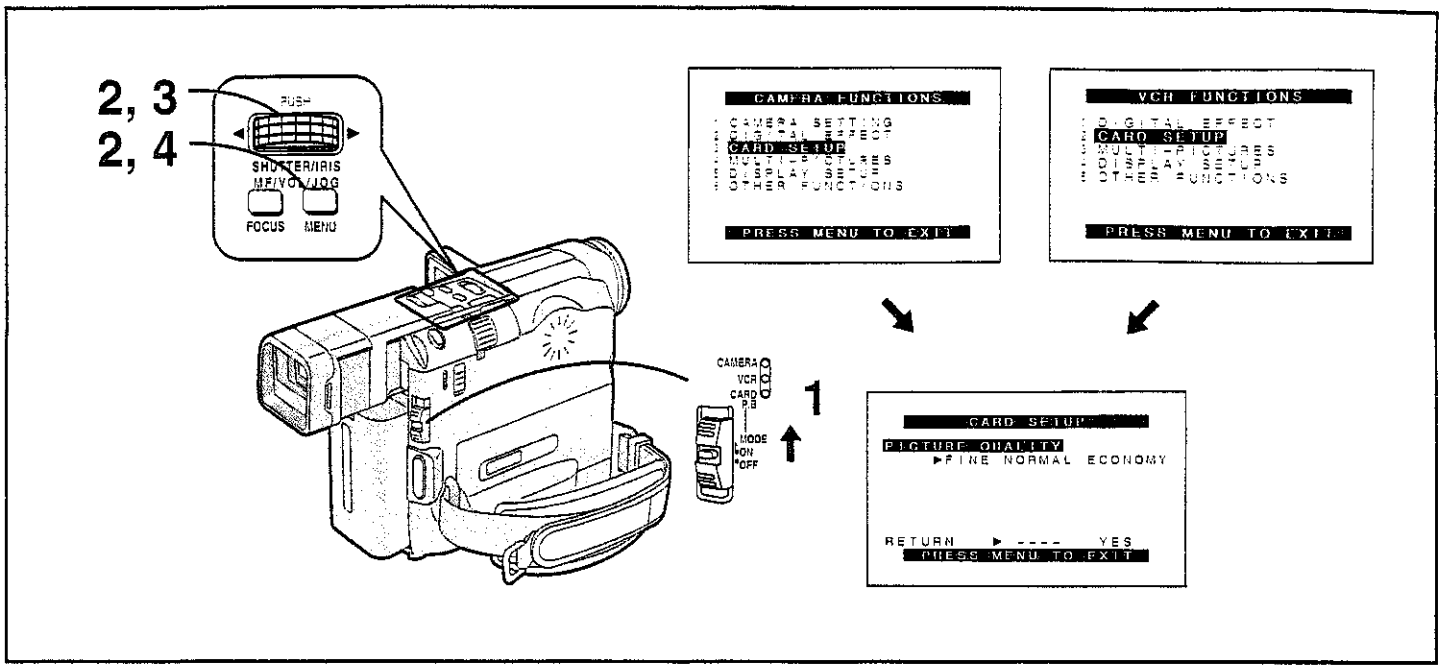
Recording Still Pictures on the MultiMediaCard in the VCR Mode:

1 **Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.**
The [VCR] Lamp lights.

2 **Slide the [TAPE/CARD] Selector to [CARD].**

3 **Start playback and press the [PHOTO SHOT] Button at the scene that you want to record.**
The picture stands still for approximately 4 seconds (when [PICTURE QUALITY] is set to [NORMAL]) while the picture is being recorded.

- Electromagnetic waves, static electricity, malfunction of the Movie Camera or of the MultiMediaCard itself could erase the data recorded on it. To prevent the loss of picture data, we recommend that you make a backup copy on a cassette (➔ 70) or on the computer (➔ 71).
- If you use the Card Photoshot Function during recording, the Movie Camera is automatically put in the Recording Pause Mode.



Quality of Card Photoshot Pictures

You can choose among 3 picture quality modes for the Card Photoshot Function.

1 Set the [OFF/ON/MODE] Switch to [ON].

2 Select [CARD SETUP] on the [VCR FUNCTIONS] Main-Menu or [CAMERA FUNCTIONS] Main-Menu. (➔ 92)

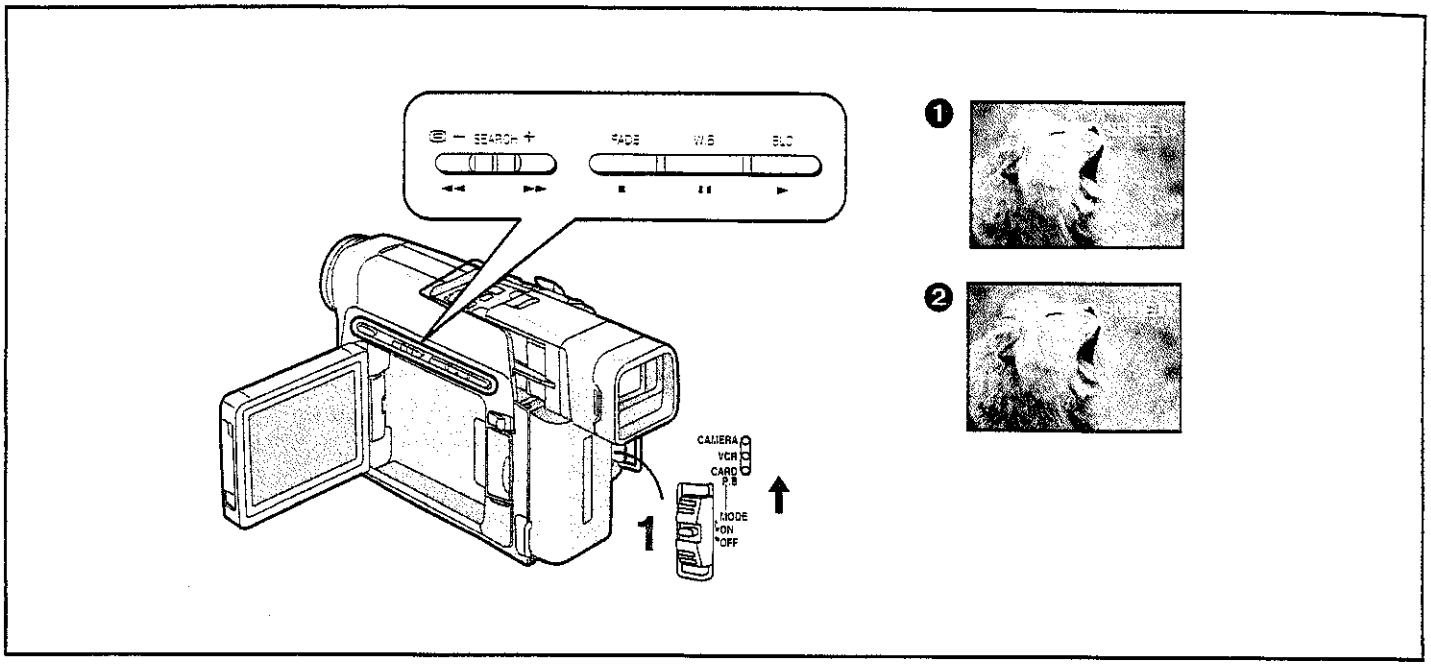
3 Push the [PUSH] Dial to set [PICTURE QUALITY] to the desired setting.

4 Press the [MENU] Button to exit the menu.

Maximum recordable number of pictures on the supplied 4 MB MultiMediaCard

FINE:	Approx. 25 pictures
NORMAL:	Approx. 50 pictures
ECONOMY:	Approx. 100 pictures

- When recording in more than one mode (FINE, NORMAL, ECONOMY) on the same MultiMediaCard, the maximum recordable number differs from the numbers indicated above.
- The maximum recordable numbers are approximations. When recording intricate pictures with fine details, the number of recordable still pictures on the MultiMediaCard decreases due to their large data volume.
- To be able to record an even larger number of still pictures, we recommend that you use the 8 MB MultiMediaCard VW-MMC8E or the 16 MB MultiMediaCard VW-MMC16E (both optional).
- To record pictures in high quality, set [PICTURE QUALITY] on the [CARD SETUP] Sub-Menu to [FINE]; to record as many pictures as possible, set it to [ECONOMY].
- When you select [ECONOMY] for recording, the playback picture may contain mosaic-like noise patterns depending on the picture content.



Playing Back Pictures Recorded on the MultiMediaCard (Card Playback)

This function lets you play back the pictures recorded on the MultiMediaCard on the Movie Camera.

Playing Back Pictures

1 Slide the [OFF/ON/MODE] Switch from the [ON] position so that the [CARD P.B] Lamp lights and the Movie Camera is in the Card Playback Mode.

The last recorded still picture on the MultiMediaCard is displayed.

To play back later recorded pictures:
Press the [SEARCH+] Button.

To play back earlier recorded pictures:
Press the [−SEARCH] Button.

To play back all recorded pictures in succession (Slide Playback):
Press the [▶] Button.
The [SLIDE ▷] Indication appears. ❶

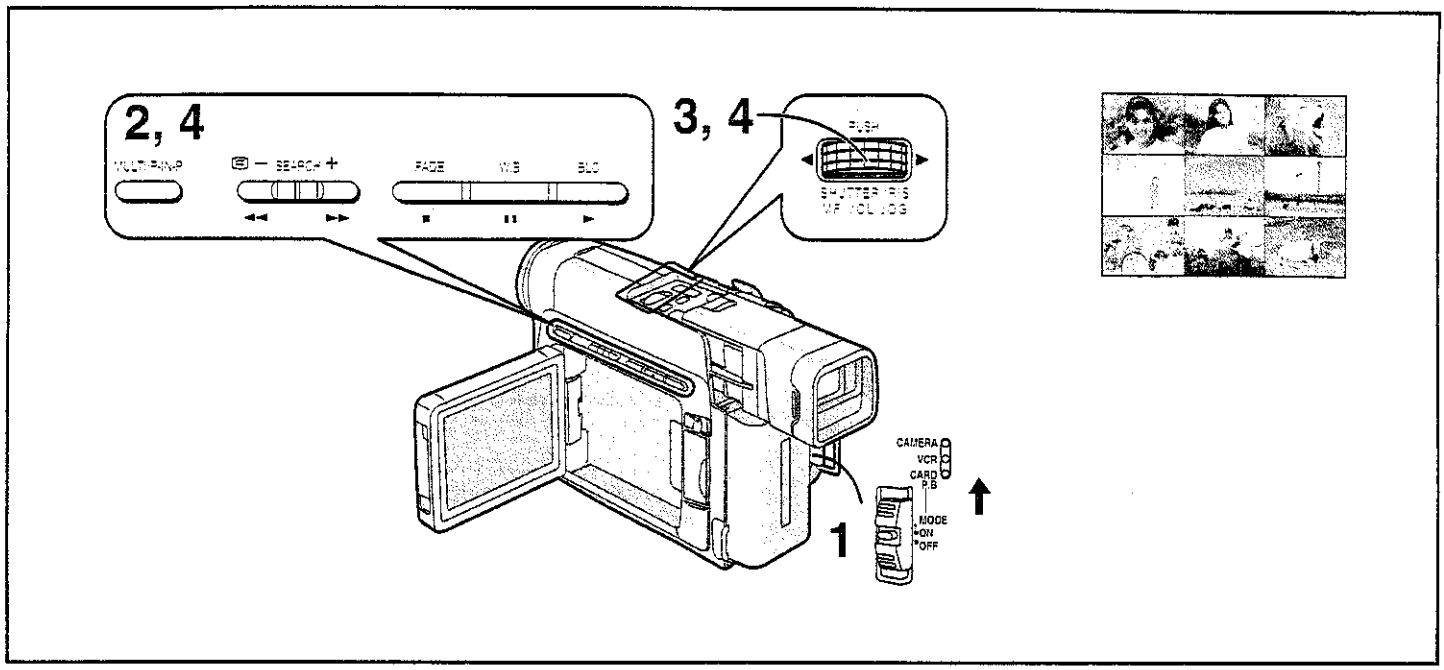
- All pictures are played back for approximately 6 seconds each, from the first to the last recorded picture, and playback then stops.

To pause the Slide Playback:
Press the [❚❚] Button.
The [SLIDE ❚❚] Indication appears. ❷

- To resume the Slide Playback, press the [❚❚] Button again or the [▶] Button. Playback resumes from the next picture and stops at the last recorded picture.

To stop the Slide Playback:
Press the [■] Button.

- To resume the Slide Playback, press the [▶] Button. Playback resumes from the next picture, and after all recorded pictures have been played back, it stops at the picture, at which you stopped the Slide Playback before.
- The [N], [F] or [E] Indication displayed in Card Playback pictures shows the volume of image data of a still picture recorded on the MultiMediaCard. (➔ 121)



Selecting and Playing Back Pictures Displayed in the Multi-Picture Mode

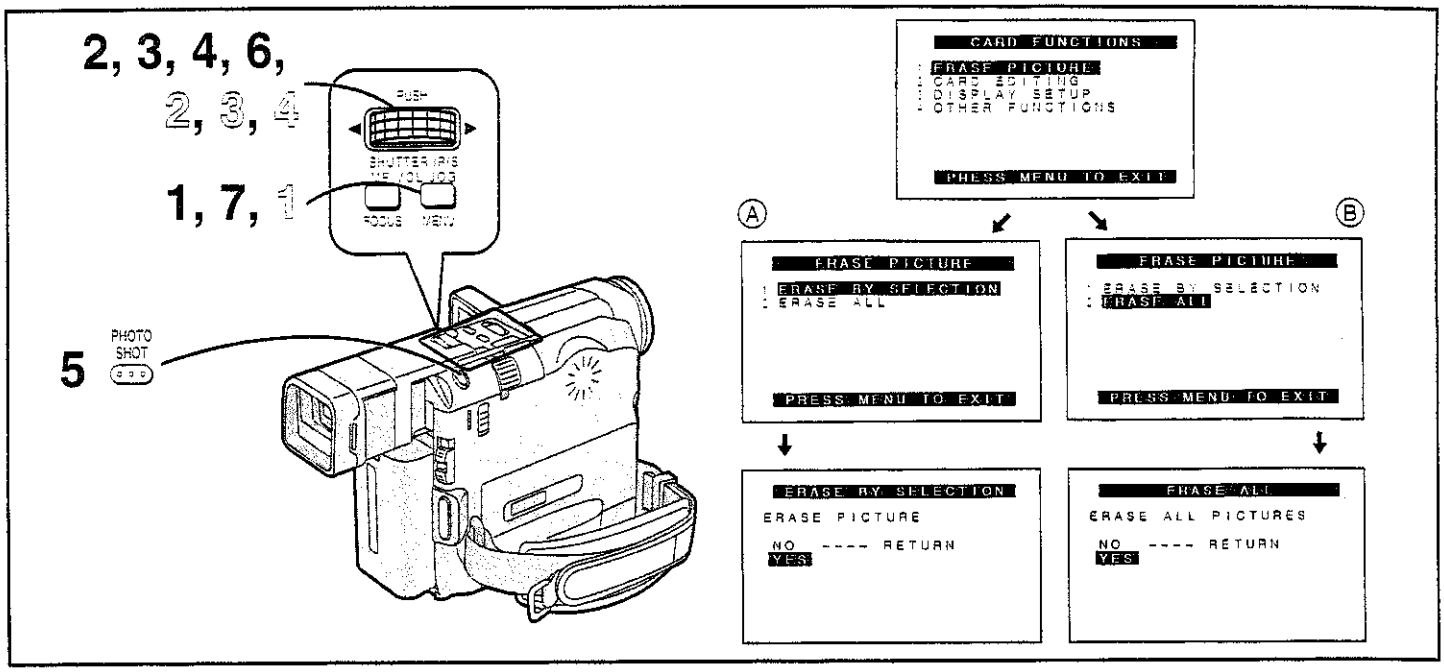
1 **Slide the [OFF/ON/MODE] Switch from the [ON] position so that the [CARD P.B] Lamp lights and the Movie Camera is in the Card Playback Mode.**
The last recorded still picture on the MultiMediaCard is displayed.

2 **Press the [MULTI] Button.**
The recorded still pictures on the MultiMediaCard are displayed in the Multi-Picture Mode.

3 **Turn the [PUSH] Dial to select the desired picture.**
The selected picture is marked with a red frame.

4 **Press the [PUSH] Dial or the [MULTI] Button.**
The selected picture appears in full screen size.

- It is not possible to select the desired multi-picture with the Remote Controller. Turn the [PUSH] Dial on the Movie Camera.
- In the Multi-Picture Mode, 9 still pictures are displayed on the same screen. If more than 9 still pictures are recorded on the MultiMediaCard, turn the [PUSH] Dial to display the next 9 pictures. (Instead of the [PUSH] Dial, you can also use the [SEARCH+] Button or the [−SEARCH] Button.)
- When you play back a blank (unrecorded) MultiMediaCard, the screen becomes white and the [− −] Indication appears.
- If you attempt to play back a still picture recorded in a different format or a picture whose image data is defective, the [×] Indication and the [CARD ERROR] Indication could appear as warning.
- When the still pictures are displayed in the Multi-Picture Mode, the Slide Playback cannot be activated.



Erasing Pictures Recorded on the MultiMediaCard

You can use the Movie Camera to erase the still pictures recorded on the MultiMediaCard.
After erasing them, the pictures cannot be recovered any more.

After putting the Movie Camera in the Card Playback Mode... (➔ 66)

Selecting and Erasing Pictures Ⓐ

1 Press the [MENU] Button.

2 Select [ERASE PICTURE] on the [CARD FUNCTIONS] Main-Menu. (➔ 92)

3 Turn the [PUSH] Dial to select [ERASE BY SELECTION] and then press it.

4 Turn the [PUSH] Dial to select the picture that you want to erase and then press it.
The selected picture flashes.

5 Press the [PHOTO SHOT] Button.
The confirmation message appears.

6 Turn the [PUSH] Dial to select [YES] and then press it.
The selected picture is now erased from the MultiMediaCard.
If you select [NO], the picture selection is cancelled.

7 Press the [MENU] Button.

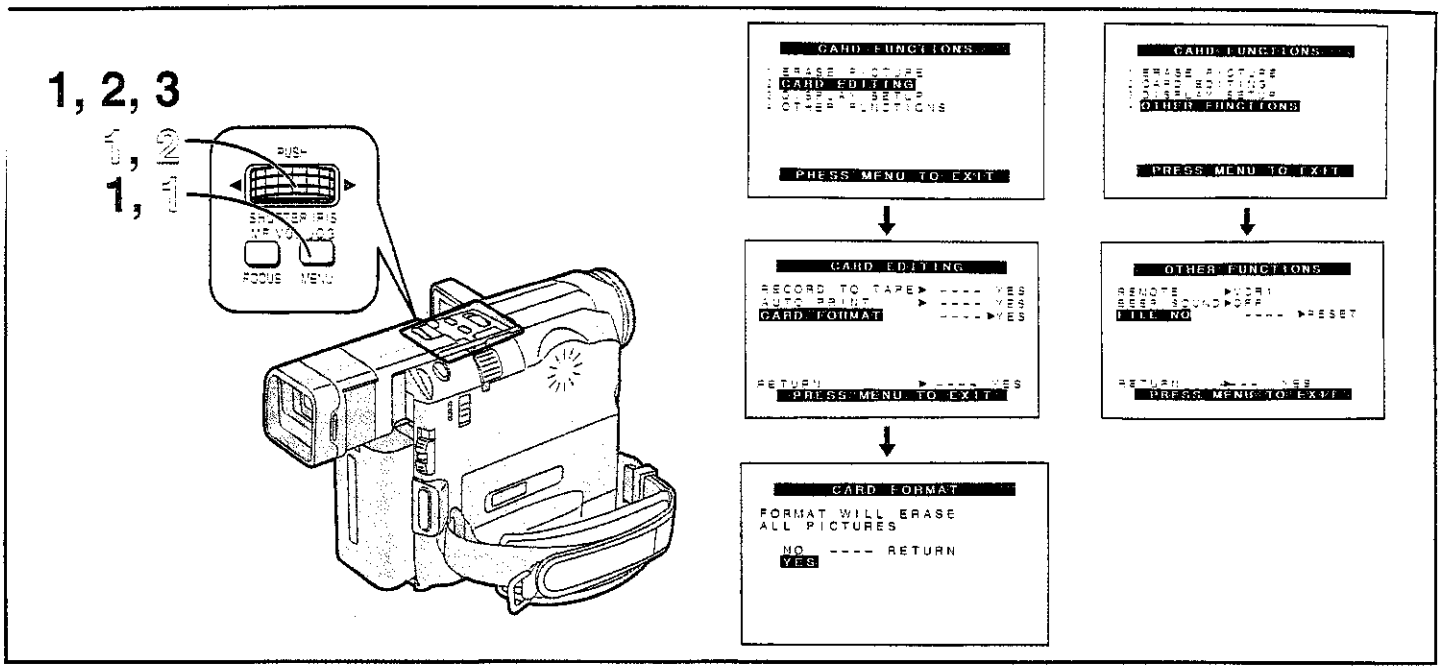
Erasing All Pictures Ⓑ

1 Press the [MENU] Button.

2 Select [ERASE PICTURE] on the [CARD FUNCTIONS] Main-Menu. (➔ 92)

3 Turn the [PUSH] Dial to select [ERASE ALL] and then press it.
The confirmation message appears.

4 Turn the [PUSH] Dial to select [YES].
All pictures stored on the MultiMediaCard are now erased.



Making the Unusable MultiMediaCard Usable (Formatting)

If the MultiMediaCard can no longer be read by the Movie Camera, it may be possible to make it usable again by formatting it.

After formatting, the previously recorded pictures cannot be recovered any more.

After putting the Movie Camera in the Card Playback Mode... (➔ 66)

1 Select [CARD EDITING] on the [CARD FUNCTIONS] Main-Menu. (➔ 92)

2 Turn the [PUSH] Dial to select [CARD FORMAT] and then press it.

The confirmation message appears.

3 Turn the [PUSH] Dial to select [YES] and then press it.

The formatting starts.

When the formatting has finished, the screen becomes white.

- We recommend that you use the AC Adaptor as power source when you format the MultiMediaCard to ensure uninterrupted power supply during formatting.

File Numbering System

When you record still pictures on the MultiMediaCard, the Movie Camera sequentially assigns file numbers which are automatically recorded together with each picture. However, when you use several MultiMediaCards or erase pictures, the numbers on a MultiMediaCard may no longer be in sequence. The file numbers can be confirmed if you import the pictures into the computer.

- If you want to record the pictures with file numbers starting from 0001, format the MultiMediaCard and then reset the file numbers.
- When the last picture recorded on the MultiMediaCard is numbered 0010.JPG, for example, the next picture recorded even after resetting the file numbers is numbered 0011.JPG.

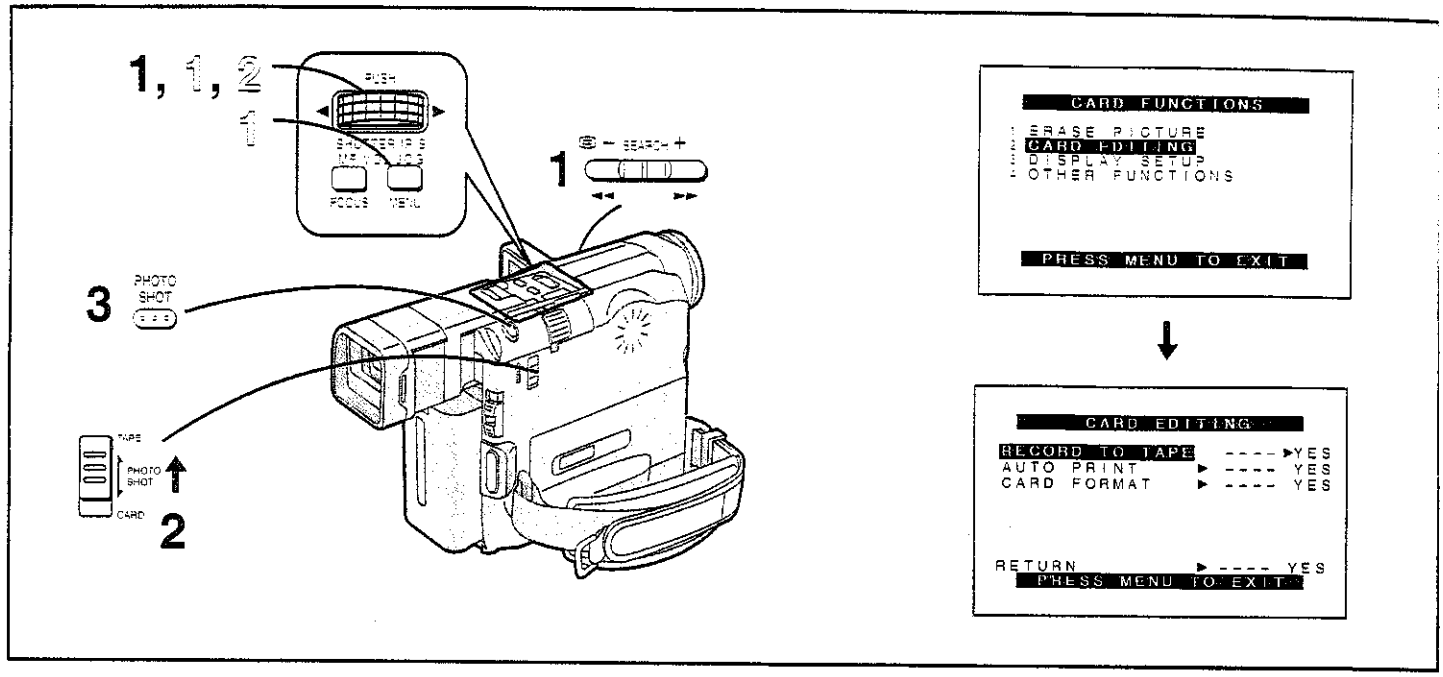
Resetting the File Numbers in the Movie Camera

1 Select [OTHER FUNCTIONS] on the [CARD FUNCTIONS] Main-Menu. (➔ 92)

2 Set [FILE NO] to [RESET].

The file number is now reset to zero.

- Formatting the MultiMediaCard does not reset the file numbers in the Movie Camera.



Copying Still Pictures from the MultiMediaCard onto the Cassette

(Picture Transmission)

It is possible to copy the still pictures recorded on the MultiMediaCard onto the cassette.

After putting the Movie Camera in the Card Playback Mode... (➔ 66)

Copying a Single Picture on the MultiMediaCard onto the Cassette

1 Display the desired picture. (➔ 66)

2 Slide the [TAPE/CARD] Selector to [TAPE].

3 Press the [PHOTO SHOT] Button.

It takes approximately 7 seconds to copy the still picture onto the cassette.

Copying All Pictures on the MultiMediaCard onto the Cassette (Picture Transmission)

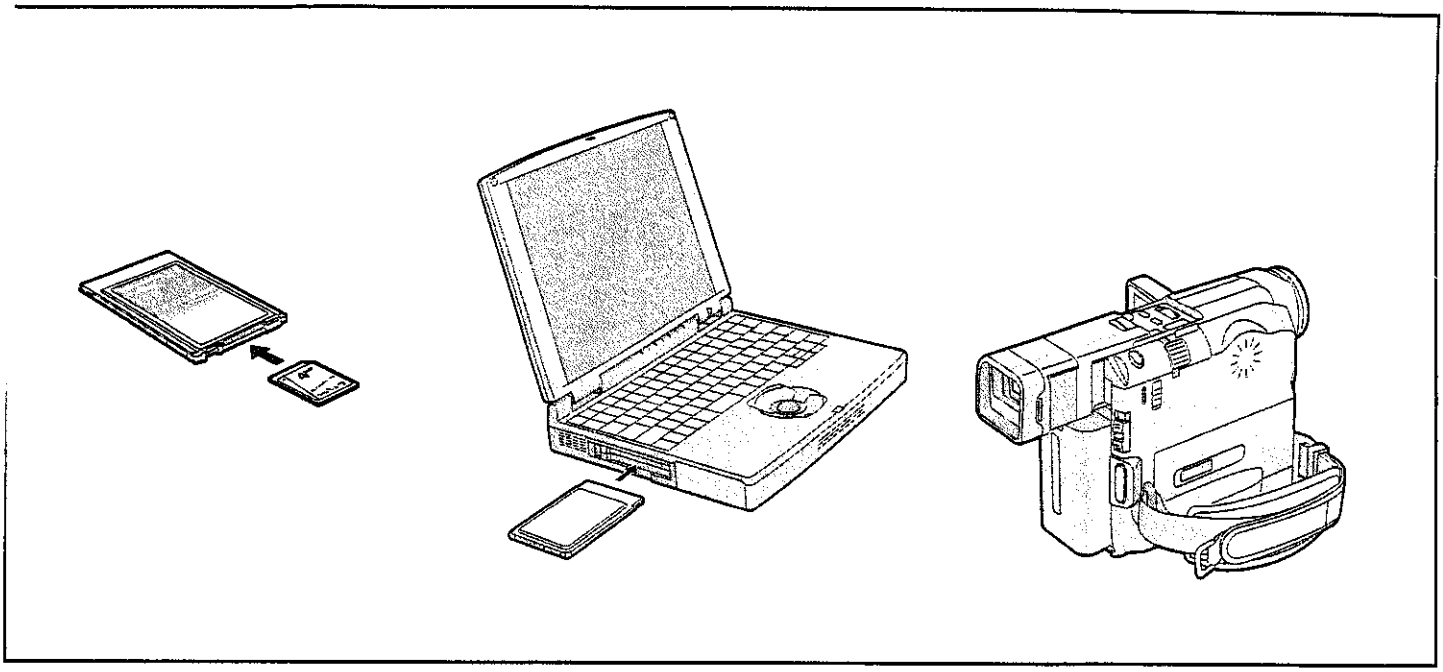
1 Select [CARD EDITING] on the [CARD FUNCTIONS] Main-Menu. (➔ 92)

2 Set [RECORD TO TAPE] to [YES].

It takes approximately 7 seconds for each of the pictures to be copied onto the cassette.

To stop the copying midway, press the [■] Button.

- When you want to copy pictures from the MultiMediaCard onto the cassette, using the Blank Search Function **(➔ 32)** makes it easy to locate the end of the recorded part or a blank part on the cassette.
- When you copy a picture from the MultiMediaCard onto the cassette, an (Photoshot) index signal is automatically recorded with it. This makes it possible to use the Index Search Function **(➔ 33)** or the Auto Print Function.
- When you use the Picture Transmission Function to copy pictures from the MultiMediaCard onto the cassette, the gradual transition from one picture to the next is also recorded for approximately 1 second each.
- When you play back the pictures copied from the MultiMediaCard onto the cassette using the Picture Transmission Function, the Date/Time Indication disappears momentarily during the gradual transition from one picture to the next.

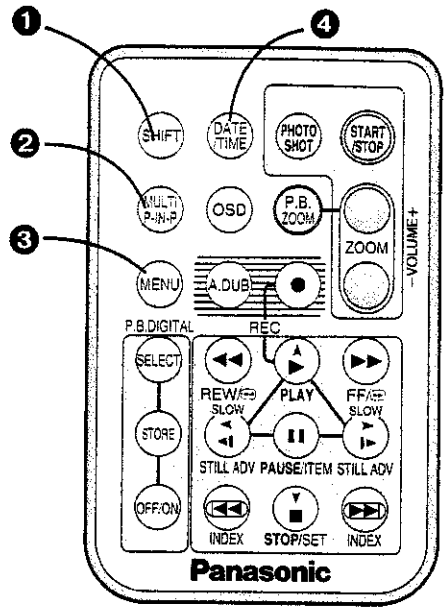


Using the Pictures Recorded on the MultiMediaCard on the Computer

Using the PC Card Adaptor (VW-MAP1E; optional) lets you view the still pictures recorded on the MultiMediaCard on a computer equipped with PC Card Type II Slot that conforms with the PC Card standard. For details on the use, also read the operating instructions of the computer and the PC Card Adaptor.

- By using the PC Card Adaptor (optional), you can import the still pictures recorded on the MultiMediaCard directly into a laptop computer or digital video printer.
- To erase pictures that you recorded on the MultiMediaCard by using the Movie Camera, be sure to erase them on the Movie Camera, not on the computer.
- You can import still pictures into the computer for editing and to add creative effects. (After editing or changing the picture data, playback on the Movie Camera is no longer possible.)
- If you record on the computer some data that is incompatible with the Movie Camera, it cannot be recognized on the Movie Camera.
- If you make any changes to the pictures on the MultiMediaCard after acquiring them on the computer, searching for pictures on that MultiMediaCard may no longer be possible.
- The MultiMediaCards can be used on computers that run Microsoft® Windows® 95/98 or Mac OS* (system 7.5 or newer).

* By using PC Exchange



Remote Controller

Using the wireless Remote Controller supplied with the Movie Camera allows operating most of the Movie Camera's major functions from a distance.

Buttons on the Remote Controller

❶ Shift Button [SHIFT]
To change the part of the picture to be enlarged in the Playback Zoom Mode when pressed together with one of the Direction Buttons. **(➜ 60)**
In this case, the functions of the following buttons are changed:

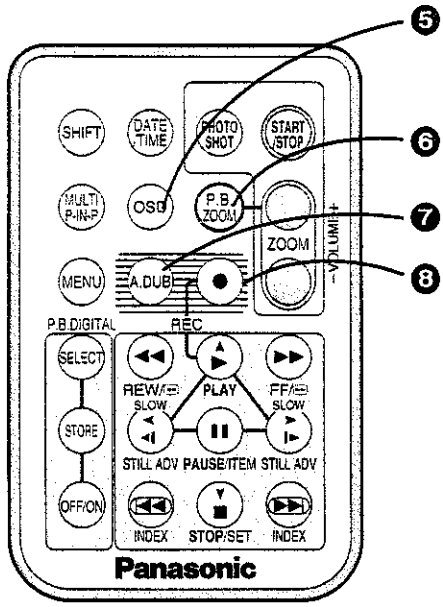
Play Button → Upward Direction Button [▲]
Slow/Still Advance Button → Left/Right Direction Button [◄, ►]
Stop Button → Downward Direction Button [▼]

❷ Multi-Picture/Picture-in-Picture Button [MULTI/P-IN-P]
To operate the same functions as with the corresponding button on the Movie Camera. **(➜ 42, 43, 45, 54, 55, 56)**

❸ Menu Button [MENU]
To display the menu. **(➜ 92)**
In this case, the functions of the following buttons are changed:

Pause Button→Item Button
To select items on the Menu.
Stop Button→Setting Button
To set the mode for the selected item.

❹ Date and Time Button [DATE/TIME]
To make the Date/Time Indication appear or disappear in the picture during recording or playback. **(➜ 118)**

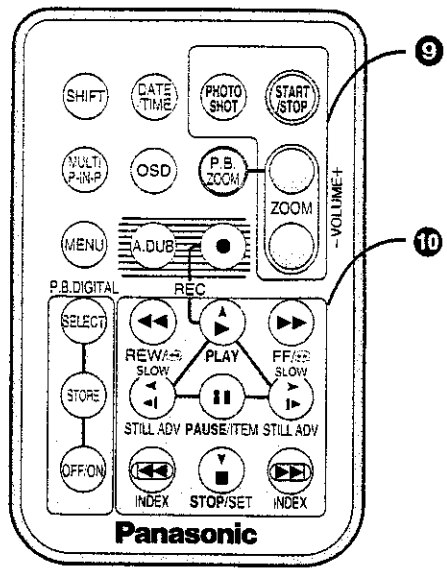


❺ Indication Output Button [OSD]
To display the function and operation indications on a connected TV. **(➔ 29)**

❻ Playback Zoom Button [P.B.ZOOM]
To enlarge a part of the playback picture. **(➔ 60)**

❼ Audio Dubbing Button [A.DUB]
To perform audio dubbing. **(➔ 61)**

❽ Recording Button [REC]
To dub digital signals input into the Movie Camera via the DV Input/Output Terminal, press the [REC] Button and the [PLAY] Button together. **(➔ 79)**



⑨ Controls for Recording and Sound Volume

Photoshot Button [PHOTO SHOT]
To record still pictures. **(➜ 20)**

Recording Start/Stop Button [START/STOP]
To start and pause recording. **(➜ 15)**

Zoom/Sound Volume Buttons [ZOOM/VOLUME]

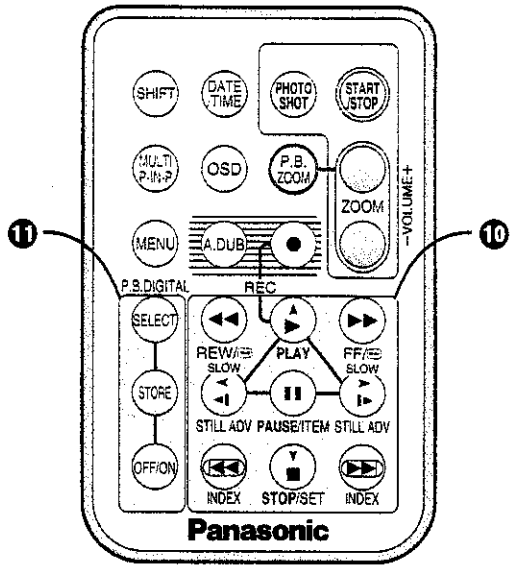
CAMERA Mode:	To zoom in and out. **(➜ 18)**
VCR Mode:	To adjust the volume of the playback sound. **(➜ 25)**
	To change the zoom magnification of the Playback Zoom. **(➜ 60)**

⑩ Controls for Playback and Menu Setting

Rewind/Review Button [◀◀]
To start review playback **(➜ 26)** if pressed during normal playback; and to rewind the tape if pressed in the Stop Mode.
Also to activate the Camera Search Function **(➜ 31)** in reverse direction if kept pressed in the Recording Pause Mode. Pressing it briefly activates the Recording Check Function **(➜ 16)**.

Fast-forward/Cue Button [▶▶]
To start cue playback **(➜ 26)** if pressed during normal playback; and to fast-forward the tape if pressed in the Stop Mode.
Also to activate the Camera Search Function **(➜ 31)** in forward direction if kept pressed in the Recording Pause Mode.

Play Button [▶]
VCR MODE:
To start playback. **(➜ 25)**
Or, when pressed together with the [SHIFT] Button, to shift upward the part of the picture to be enlarged in the Playback Zoom Mode. **(➜ 60)**
Card P.B Mode:
To play back all still pictures stored on the MultiMediaCard in succession for 6 seconds each. **(➜ 66)**



⑩ Controls for Playback and Menu setting (Continued)

Slow Motion/Still Advance Button [◄I, I►]
To perform Slow Motion Playback if pressed in the Normal Playback Mode; and to perform Still Advance Playback if pressed in the Still Playback Mode. **(➔ 27, 28)**
(◄I: in reverse direction, I►: in forward direction)
Or, when pressed together with the [SHIFT] Button, to shift to the left or right the enlarged part of the picture in the Playback Zoom Mode. **(➔ 60)**

Index Search Button [I◄◄, ►►I]
To search for recorded scenes marked with an index signal and for still images recorded in the Photoshot Mode. **(➔ 34, 35)**
(I◄◄: in reverse direction, ►►I: in forward direction.)
To locate the tape position of a small still picture displayed in the Multi-Picture Mode. **(➔ 58)**
(In this case, select the desired still picture on the screen and then press either button.)

Stop Button [■]
To stop the tape. **(➔ 25)**
Or when the menu is displayed, to set a desired mode or value for the selected item. **(➔ 92)**
Or, when pressed together with the [SHIFT] Button, to shift downward the enlarged part of the picture in the Playback Zoom Mode. **(➔ 60)**

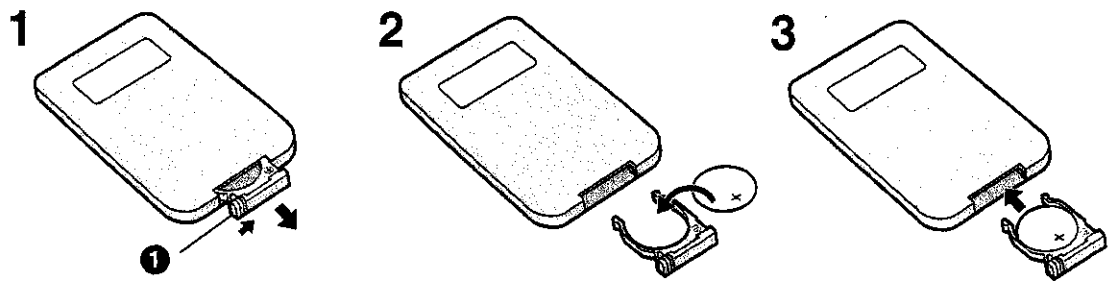
Pause Button [❚❚]
To pause playback. **(➔ 28)** The playback picture stands still.
Or when the menu is displayed, to select an item. **(➔ 92)**

⑪ Playback Digital Effects

Selection Button [SELECT]
To select the desired digital effect for [EFFECT SELECT] on the [DIGITAL EFFECT] Sub-Menu of the [VCR FUNCTIONS] Main-Menu. **(➔ 53)**

Store Button [STORE]
To store a still picture in memory for the Wipe or Mix Function. **(➔ 59)**

Off/On Button [OFF/ON]
To suspend the selected digital effect or re-activate it. **(➔ 53)**
To start a Wipe or Mix transition from the still picture stored in memory. **(➔ 59)**



Remote Controller (Continued)

■ Inserting the Button-type Battery

Insert the supplied button-type battery before using the Remote Controller.

1 Pull out the Battery Holder while pressing the Stopper ❶.

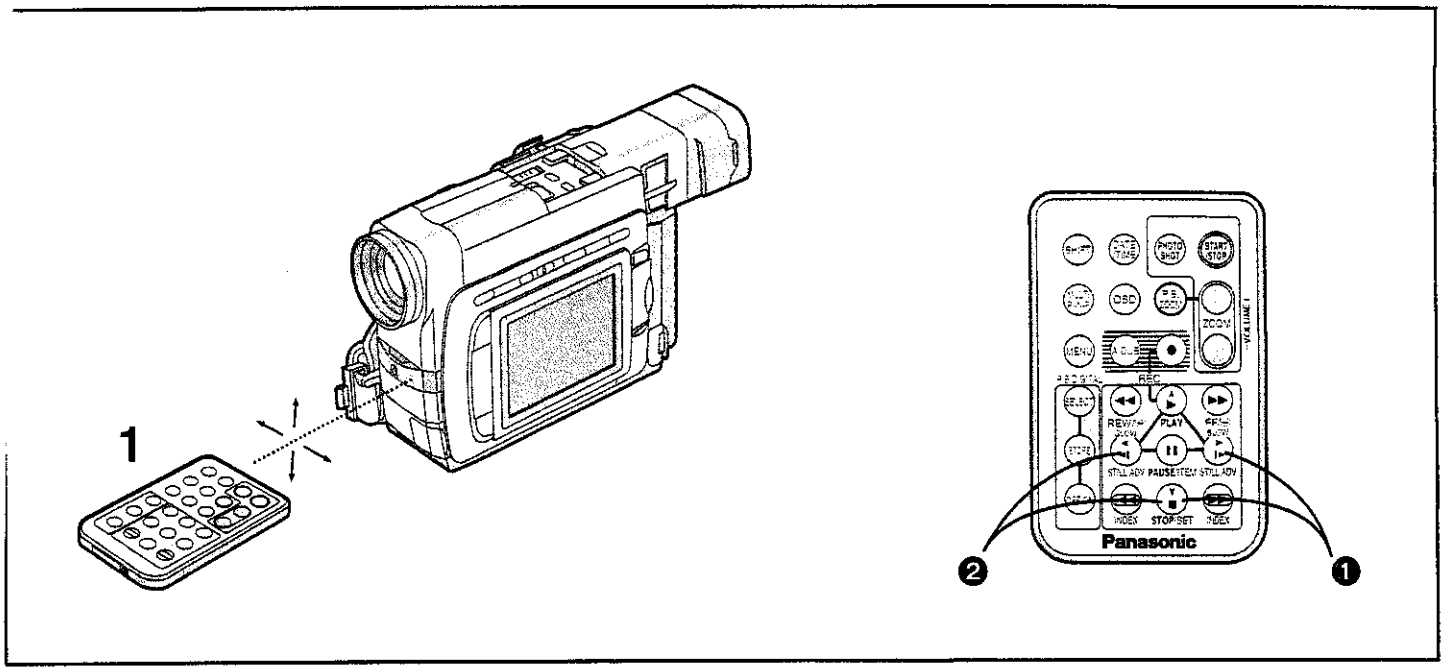
2 Insert the button-type battery with the stamped (+) mark facing upward.

3 Insert the Battery Holder into the Remote Controller.

- When the button-type battery is exhausted, replace it with a new CR2025 battery.
  (The life of the battery is about 1 year. However, it depends on the frequency of use.)
- **Keep the button-type battery out of the reach of children.**
- Make sure you insert the battery with its poles correctly aligned.

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



■ Using the Remote Controller

1 Aim the Remote Controller at the Remote Control Sensor on the Movie Camera and press the appropriate button.

Distance to the Movie Camera: Less than 5 metres.
Angle: Approximately 15° up, down, left and right from centre axis.

- The operative range described above is valid for using the Remote Controller indoors.
  When using it outdoors or under strong lights, it may not work correctly even within the above range.
- Within a distance of about 1 metre, it is also possible to use the Remote Controller from the side (LCD Monitor side).

Selecting the Remote Controller Mode

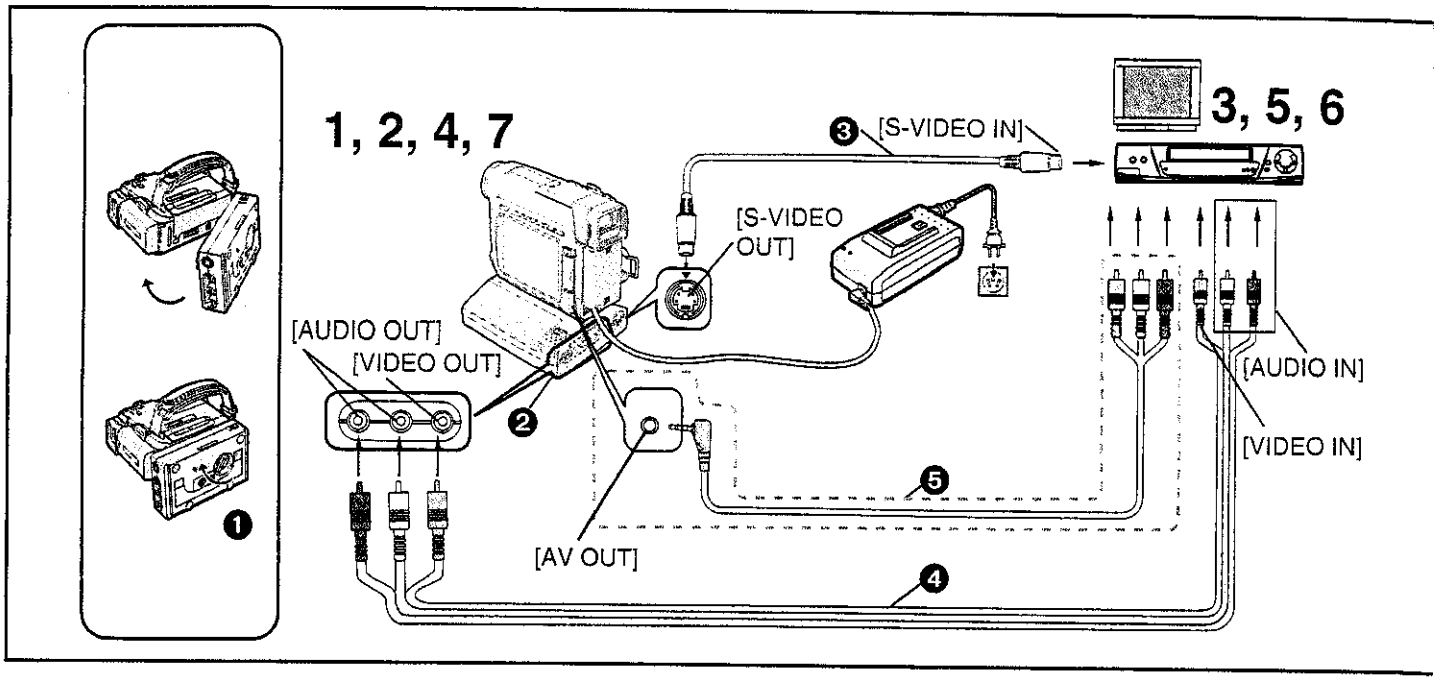
When using two Movie Cameras at the same time, selecting different Remote Controller Modes makes it possible to operate them separately.

- If the Remote Controller Mode set on the Movie Camera and on its Remote Controller are not matched, the [REMOTE] Indication appears.

Setting to Be Made on the Movie Camera:
Set [REMOTE] on the [OTHER FUNCTIONS] Sub-Menu to the desired Remote Controller Mode.

Setting to Be Made on the Remote Controller:
[VCR1]: Press the [▮►] Button and [■] Button simultaneously. ❶
[VCR2]: Press the [◄▮] Button and [■] Button simultaneously. ❷

- Replacing the button-type battery in the Remote Controller automatically resets it to the [VCR1] Mode.



Copying onto an S-VHS (or VHS) Cassette (Dubbing)

If you attach the Output Terminal Box, you can copy cassettes recorded from this Movie Camera onto S-VHS or VHS cassettes.

After connecting all equipment as shown above, perform the following operations.

- To connect the Movie Camera to the VCR, you can use either the AV Cable ❹ or ❺, however, do not connect both cables at the same time.
- Before copying, be sure to press the [OSD] Button on the Remote Controller (→ 73) so that no indications are visible. Otherwise, the displayed tape counter and function indications are also copied.

1 **[Movie Camera]**
Insert the recorded cassette.

2 **Attach the Output Terminal Box [AV ONE TOUCH STATION] to the underside of the Movie Camera with the Screw ❶.**

3 **[VCR]**
Insert an unrecorded cassette with intact erasure prevention tab.
As some settings (external input, tape speed, etc.) on the VCR are necessary, please refer to your VCR's operating instructions.

4 **[Movie Camera]**
Press the Playback Button [▶] to start playback.

5 **[VCR]**
Press the Recording Button to start recording.

6 **[VCR]**
Press the Pause or Stop Button to stop recording.

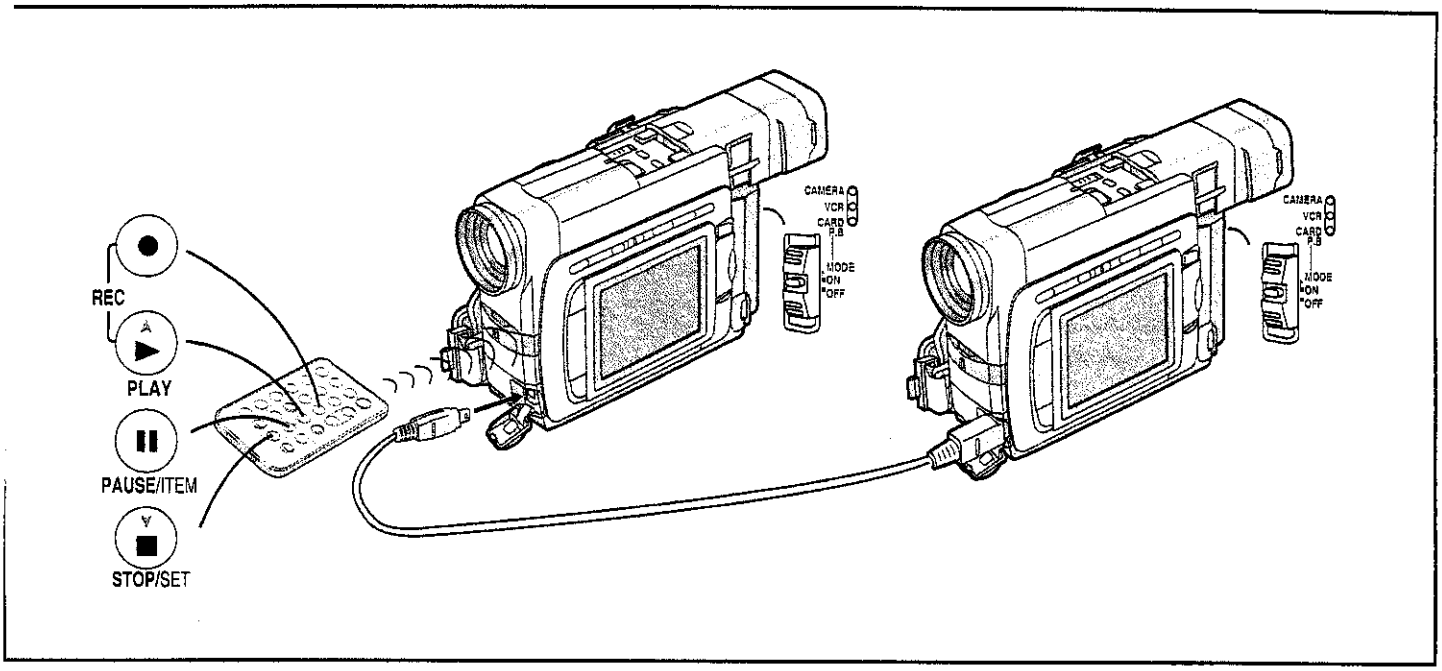
7 **[Movie Camera]**
Press the Stop Button [■] to stop playback.

❷ Output Terminal Box

❸ S-Video Cable

❹ AV Cable (PHONO-PHONO)

❺ AV Cable (PHONO-M3)



Using with Digital Video Equipment
(Recording)

If you connect this Movie Camera with other Digital Video equipment (for example another Movie Camera of the same type) equipped with DV Input/Output Terminal (i.LINK) using the DV Cable VW-CD1E (optional), you can dub high-quality picture and sound in the digital format.

1 **[Playback Unit]**
Insert the recorded cassette and slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

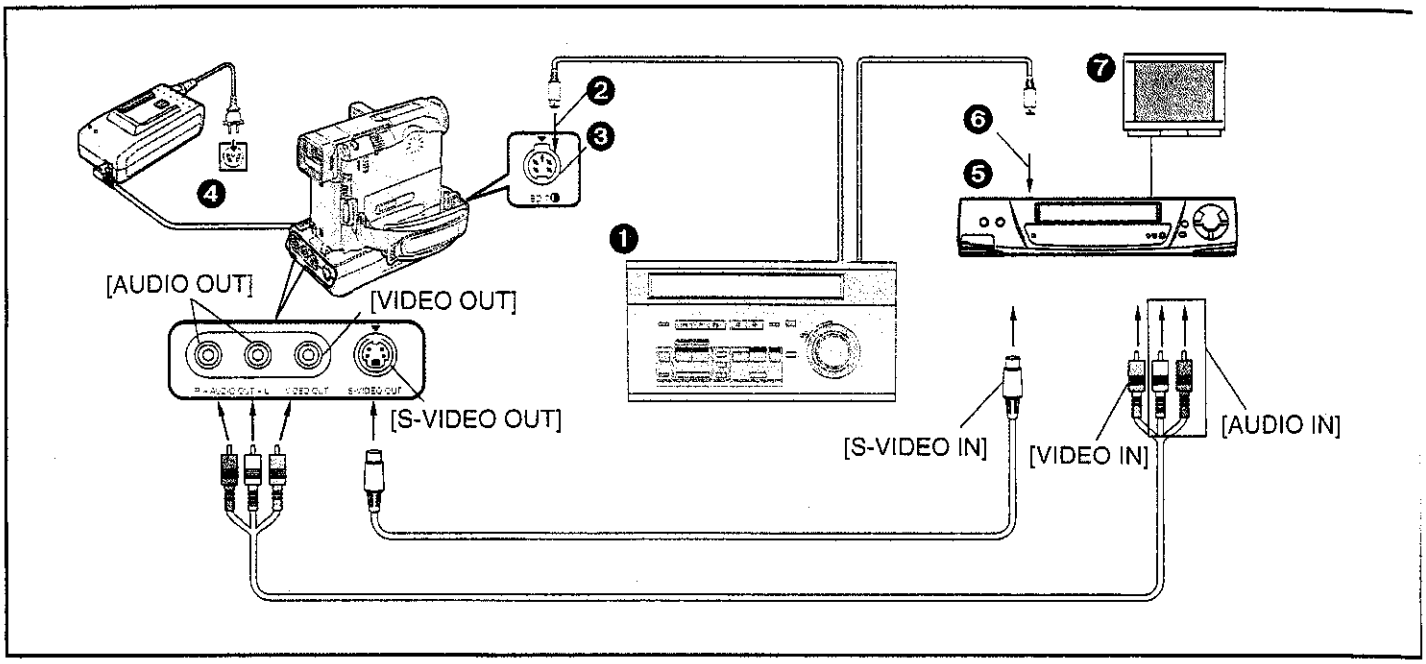
2 **[Recording Unit]**
Insert a cassette onto which you want to perform dubbing and slide the [OFF/ON/MODE] switch so that the [VCR] Lamp lights.

3 **[Playback Unit]**
Press the Playback Button [▶] to start playback.

4 **[Recording Unit]**
While pressing the [REC] Button, press the [PLAY] Button (both on the Remote Controller).
Recording starts.

Stopping Recording
Press the Pause Button [❚❚] or the Stop Button [■] to stop recording.

- Regardless of the setting for [AUDIO REC] on the Menu of the recording unit, dubbing is performed in the same audio recording mode as that of the cassette in the playback unit.
- The lower part of the monitor picture of the recording unit (the picture displayed on the LCD Monitor, Finder or TV) may be distorted, or the picture may roll up and down. However this is not a malfunction and does not affect the actually recorded pictures.
- If the DV Cable is not connected, a blank picture is recorded.
- If you set [REC SPEED] on the [OTHER FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Menu to [LP] on the recording unit, the possible recording time is 1.5 times as long as in the SP Mode. **(➜ 96)**



Copying with the Help of an Editing Controller

If you connect the Movie Camera to an Editing Controller equipped with 5-pin Edit Socket, this Movie Camera's playback functions can be controlled from the Editing Controller.
(The Output Terminal Box [AV ONE TOUCH STATION] is necessary.)

After connecting all equipment as shown above, perform the necessary operations.

When Connecting the Editing Controller VW-EC500E ❶ (optional)

- A VCR equipped with 5-pin Edit Socket is necessary.
- When you connect the VW-EC500E to the Movie Camera, an adjustment on the VW-EC500E is necessary. For the operation of the Editing Controller, refer to its operating instructions.

When Editing with Time Code

Set [DISPLAY] on the [DISPLAY SETUP] Sub-Menu of the [VCR FUNCTIONS] Main-Menu to [TIMECODE] to make the Time Code appear.

- When the Time Code is displayed, the Time Code Signal is output from the Edit Socket.
- When the Counter Indication is displayed, the Linear Tape Counter Signal is output.

❷ To Edit Socket

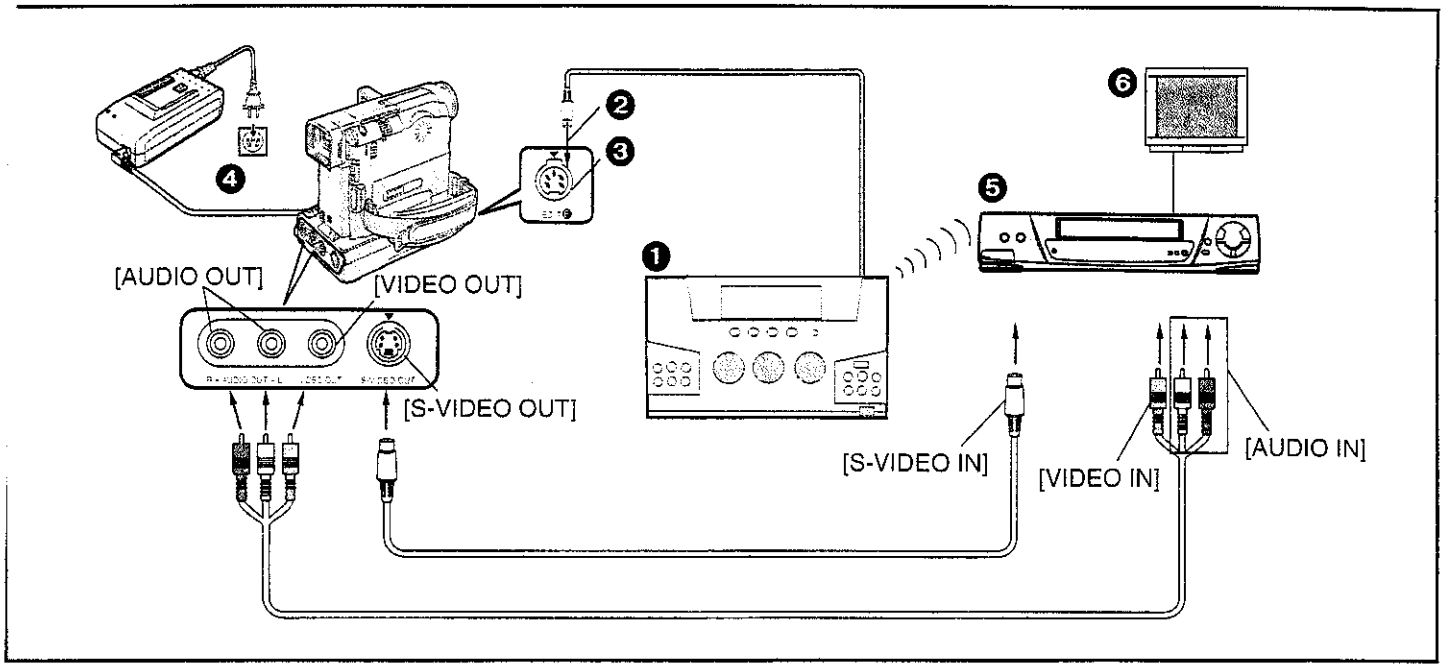
❸ Edit Socket

❹ Connect the AC Adaptor.

❺ VCR (not supplied)

❻ To Edit Socket

❼ TV (not supplied)



When Connecting the Editing Controller VW-EC1E ❶ (optional)

- When you use the Editing Controller VW-EC1E, it is not necessary to connect it to the Edit Socket on the VCR, as the VCR's operation is performed via infrared remote control. Therefore, editing is also possible onto VCRs not equipped with an Edit Socket.
- For the operation of the Editing Controller, refer to its operating instructions.

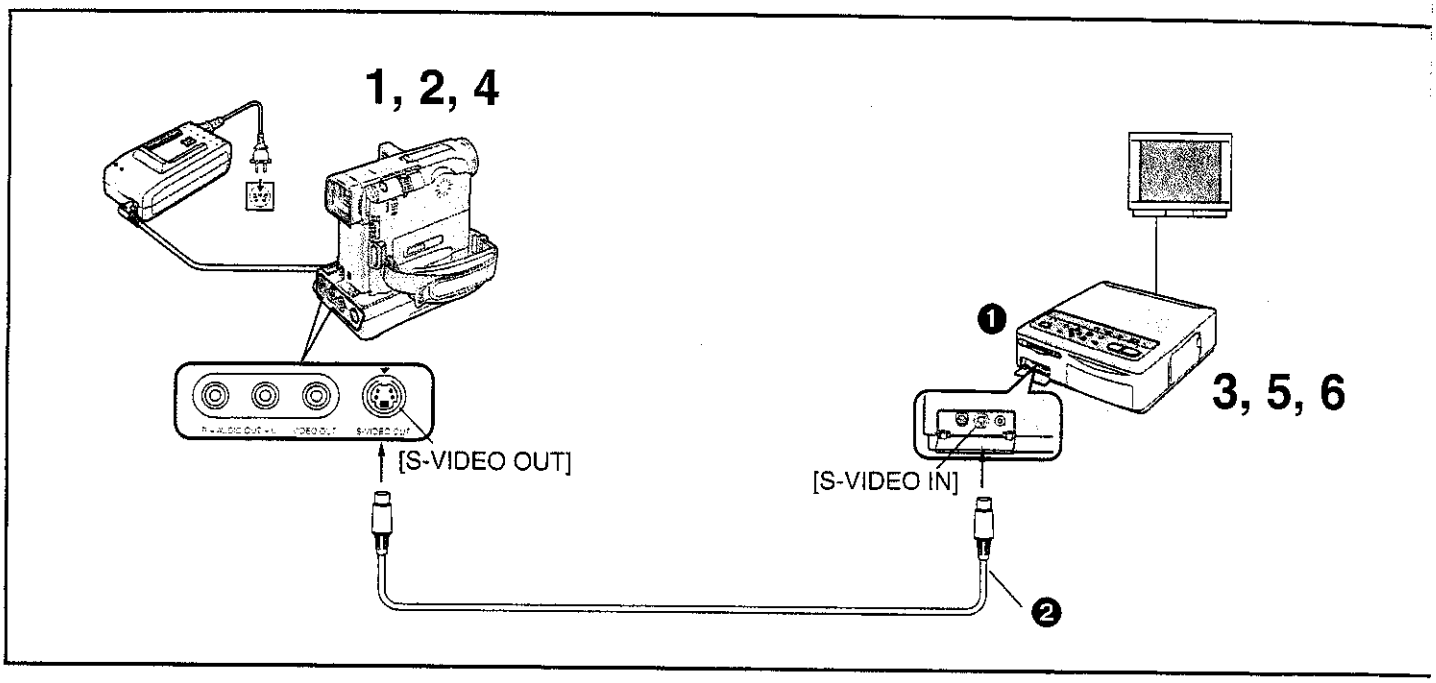
❷ To Edit Socket

❸ Edit Socket

❹ Connect the AC Adaptor.

❺ VCR (not supplied)

❻ TV (not supplied)



Using the Movie Camera with a Video Printer

If you connect the Movie Camera to a Video Printer ❶, you can print still pictures from scenes recorded with the Movie Camera.

Movie Camera:

1 Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

2 Insert a recorded cassette.

Video Printer:

3 Turn the Video Printer on.

Movie Camera:

4 Press the Play Button [▶].

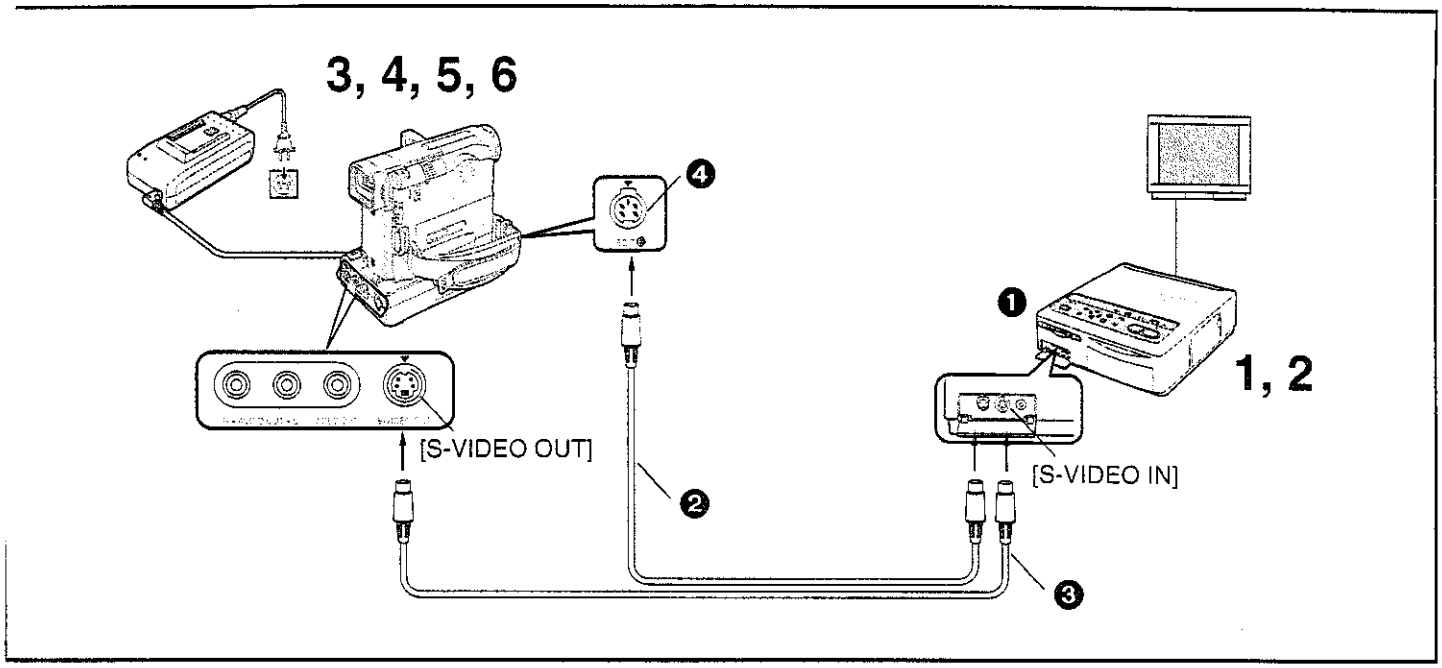
Video Printer:

5 Store the image in memory.

6 Start printing.

- For details about the operation of the Video Printer, read its operating instructions.
- Compatibility cannot be guaranteed for pictures recorded on other video equipment and played back on this Movie Camera, or vice versa.

❷ S-Video Cable



Using the Automatic Printing Function
(Autoprint)

If you connect the Movie Camera to a Video Printer ❶ equipped with a 5-pin Edit Socket, you can use the Autoprint Function to automatically print all still pictures recorded with the Photoshot Function. You can also select and print a single multi-picture from the displayed multi-pictures.

Video Printer:

1 Turn the Video Printer on.

2 Make the necessary settings on the Video Printer according to the input signal.

Movie Camera:

3 Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

To print all recorded Photoshot pictures automatically:

4 Search for the first still picture from which you want to start printing with the Autoprint Function.
If you want to print all still pictures recorded on the cassette, rewind the tape to its beginning.

To print a single Multi-Picture:

4 When still pictures are displayed in the Multi-Picture Mode, turn the [PUSH] Dial to select the picture that you want to print. (➔ 58)

5 Press the [MENU] Button.

6 Set [AUTOPRINT] on the [OTHER FUNCTIONS] Sub-Menu to [YES].
Automatic printing starts.

- If you want to stop the automatic printing in the middle, press the Stop Button [■] on the Movie Camera.

❷ Edit Cable VW-K5E (optional)

❸ S-Video Cable

❹ Edit Socket

- When the cooling function of the Video Printer is activated and the printing speed slows down, automatic printing may stop. In this case, set [AUTOPRINT] on the [OTHER FUNCTIONS] Sub-Menu on the [VCR FUNCTIONS] Main-Menu to [YES] again.

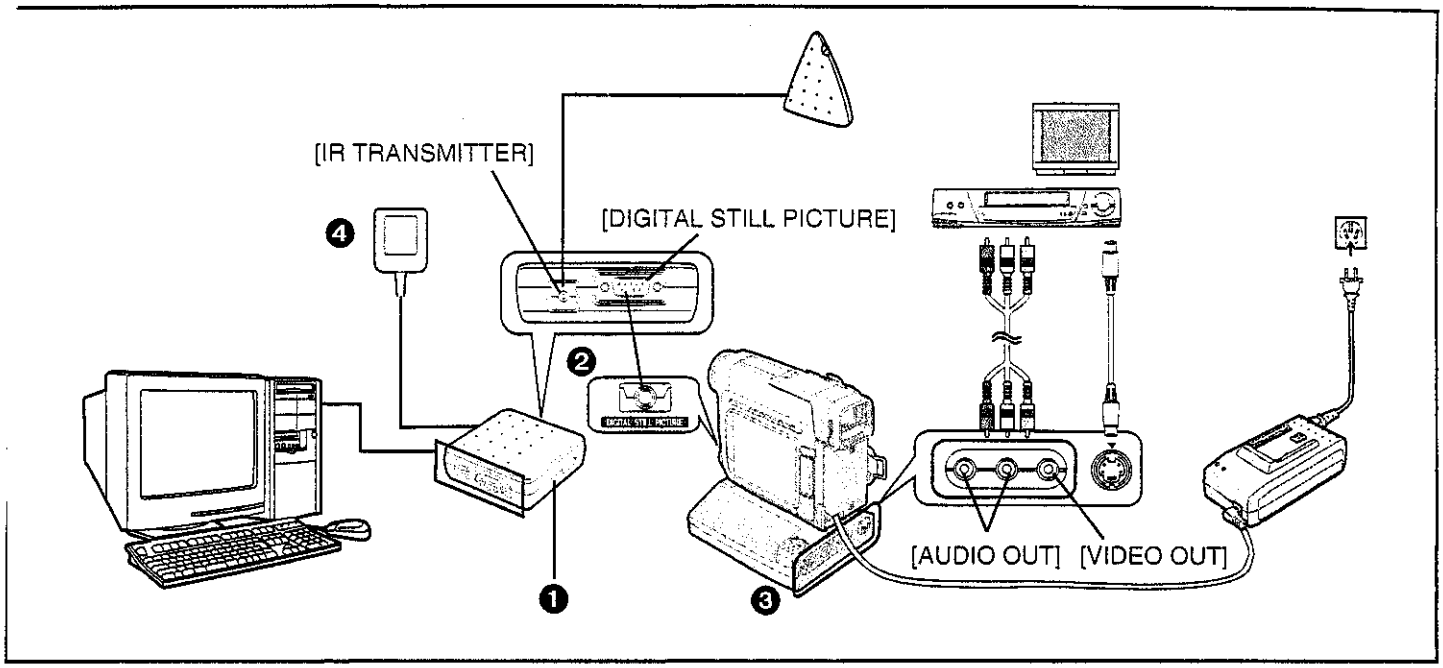
- If you replace the ink cassette or paper during printing, the same picture may be printed twice.

- If still pictures are recorded successively in the Photoshot Mode, some pictures may be skipped during printing.

- Before storing an image in memory on the Video Printer, press the [OSD] Button (➔ 73) on the Remote Controller of the Movie Camera so that no indications appear in the picture. Otherwise, the Counter Indication and other function indications are also printed in the picture.

- The [PRINTER ERROR] Indication appears if the Movie Camera is not correctly connected to the Video Printer or when the ink cassette and/or the paper in the Video Printer are not loaded or used up.
- As index signals are not recorded with the still pictures recorded in the Continuous Photoshot Mode, automatic printing of these pictures is not possible.
- If you select one of 9 pictures displayed in the Strobe Multi-Picture Mode and print it with the Autoprint Function, the tape position of the selected picture may not be precise.
- In the following cases, some pictures may be skipped when printing with the Auto Print Function.
  - When you print still pictures recorded in the Photoshot Mode on a video camera of another brand.
  - If you turn the Movie Camera on and off several times (3 times or more) between recording two still pictures in the Photoshot Mode.
  - When you record a still picture in the Photoshot Mode on the same part of a cassette where a Photoshot picture was recorded before.
  - When you select a different recording speed (SP/LP) between the recording of two still pictures in the Photoshot Mode.
  - At the first Photoshot picture to be printed.

- A picture that is recorded very close to the beginning of the tape may not be printed.
- Pictures that you have edited or composed on a Video Printer (NV-MPD1EN, NV-MPD5EN, NV-MPD7EN) can be saved on the MultiMediaCard, however, they can no longer be played back on this Movie Camera.



Using the Movie Camera with a Computer

The Personal Computer Connection Kit VW-DTA9E (optional) or VW-DTA10A (optional) makes it possible to connect the Movie Camera to a computer and transmit still video images to it. (The Output Terminal Box [AV ONE TOUCH STATION] is also necessary.)

The above illustration shows the connections in case of using the VW-DTA10A. For the VW-DTA9E, refer to its operating instructions.

Computer System Requirements (VW-DTA10A)

DV STUDIO2 can be installed in a PC/AT compatible personal computer which can run Microsoft® Windows® 95/98.

Compatible machines:
Personal computer with 80486DX4 or higher CPU (Pentium™ or higher recommended)

Graphic card:
True Color (approx. 16.7 million colours) recommended (operation also possible even with 256 colours)

Installed memory:	16 MB or more (32 MB or more recommended)
Free hard disk space:	At least 16 MB
Disk drive:	CD-ROM drive
Ports:	RS-232C (D-sub 9pin) or USB
Other requirements:	Mouse

To connect the Movie Camera to the computer, use the special Interface Box ❶ contained in the Personal Computer Connection Kit.

- To use the DV STUDIO2 software via USB, a computer with Windows® 98 preinstalled is necessary.
- Pictures that you intend to import from cassette into computer applications should be recorded in the SP Mode.
- When recording, take care that the Time Code is uninterrupted from the beginning of the tape.
- For detailed explanations on the operating environment, connections and operations, refer to the Personal Computer Connection Kit's operating instructions.

❷ Digital Still Picture Terminal

❸ Output Terminal Box [AV ONE TOUCH STATION]

❹ AC Adaptor

For Those Who Use the Personal Computer Connection Kit (VW-DTA10A)

With the Personal Computer Connection Kit (VW-DTA10A; optional), you can perform the following operations:

❶ Importing still pictures into the computer when the Movie Camera is in the VCR Mode

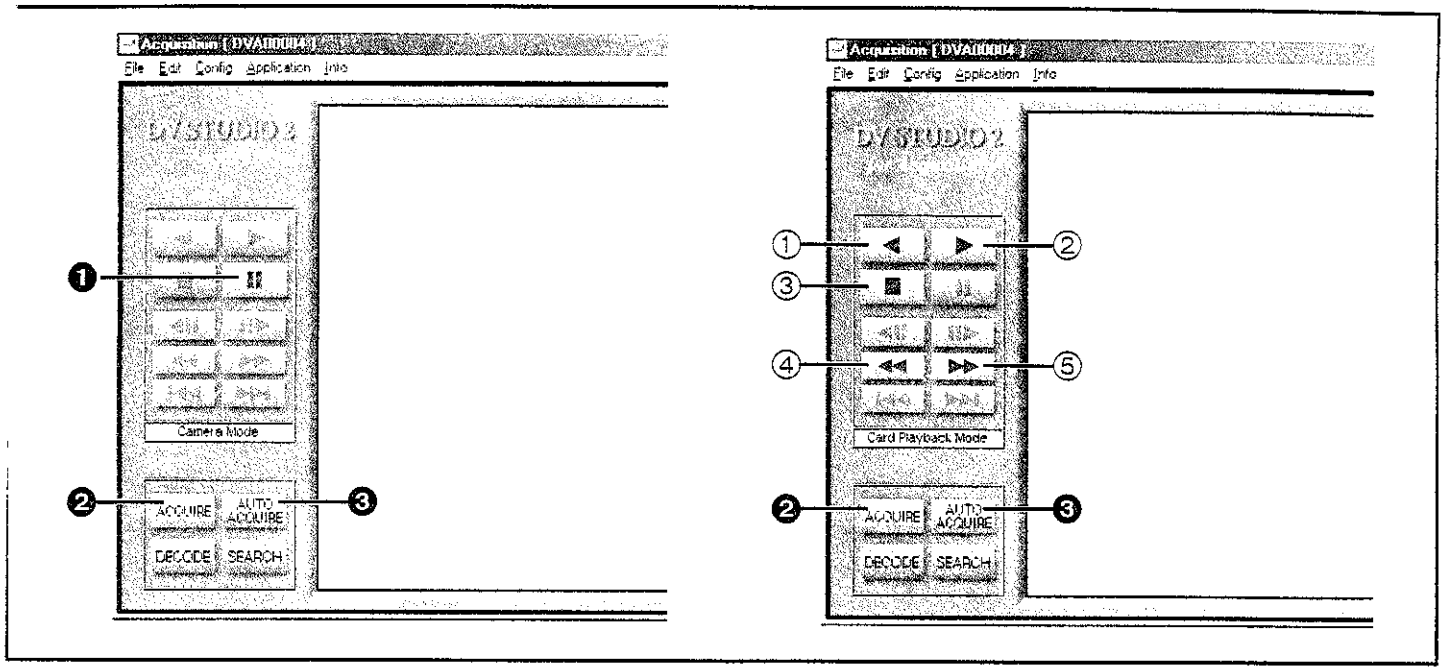
❷ Importing still pictures into the computer when the Movie Camera is in the Camera Mode

❸ Importing still pictures into the computer when the Movie Camera is in the Card Playback Mode

❹ Easy editing

Only the above functions ❷ and ❸ are explained here. For the other functions, refer to the operating instructions of the Personal Computer Connection Kit (VW-DTA10A).

- When the Movie Camera is in the Camera Mode or Card Playback Mode, it is not possible to perform Easy Editing ❹ by using [DV STUDIO 2 for Editing].
- Follow the operation steps explained on pages 89–93 after making all necessary connections and installing the software of the Personal Computer Connection Kit on the computer.
- To be able to operate the Movie Camera from the computer (e.g. to locate the position on the cassette or MultiMediaCard of a picture in a DV album or to decode an acquired picture), select the VCR Mode for pictures recorded on the cassette, or the Card Playback Mode for pictures recorded on the MultiMediaCard.
- Communications may sometimes be interrupted by the operations of the OS or other software that is running simultaneously. If this should happen, reconnect after the other operation is complete.



Parts and their functions (Camera Mode)

When the movie camera is in Camera Mode, only the buttons that can actually be used are active.

- The functions of the following on-screen buttons are different from those of the same buttons on the Movie Camera.

❶ **Still [▮▮]**
To capture a still picture through the camera lens, or to cancel the still picture mode.

❷ **Acquire [ACQUIRE]**
Click this button to acquire the scene as a still picture.

❸ **Auto acquire [AUTO ACQUIRE] (➔ 89)**
The scene is automatically acquired as still pictures.

(Card Playback Mode)

① **Back [◀]**
Each time the button is clicked, the preceding memory screen is displayed.

② **Forward [▶]**
Each time the button is clicked, the next memory screen is displayed.

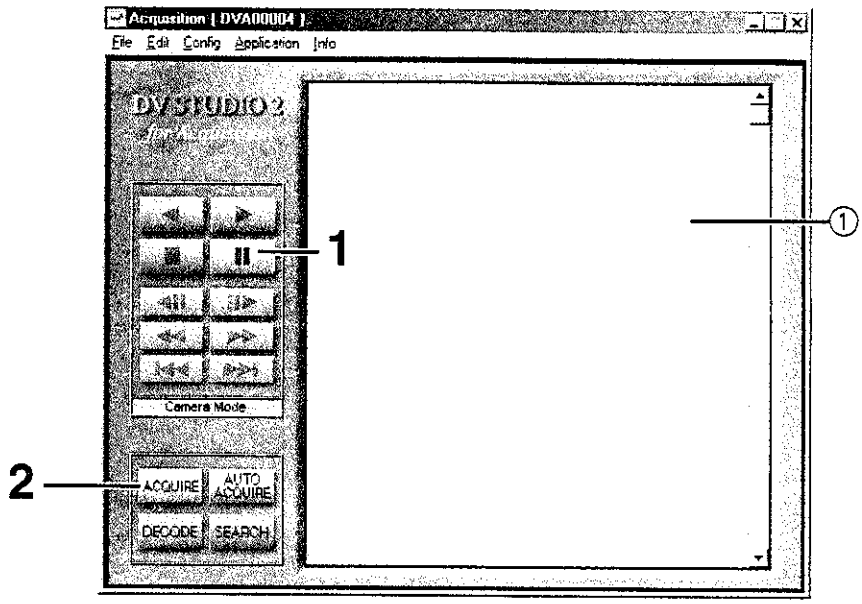
③ **Multi-picture display [■]**
To display the still pictures in the Multi-Picture Mode.
To switch back to the normal single-picture mode, click this button again.

④ **Back (multi-picture display) [◀◀]**
Each time the button is clicked, the preceding multi-picture screen is displayed.

⑤ **Forward (multi-picture display) [▶▶]**
Each time the button is clicked, the next multi-picture screen is displayed.

- The buttons ❷ and ❸ described above for the Camera Mode can also be used in the Card Playback Mode.

For information on functions not described here, see "Parts and their functions with movie camera in VCR Mode" of the Personal Computer Connection Kit's operating instruction (VW-DTA10A).



Acquiring digital still pictures in Camera Mode to create a DV album

Use the procedure described below to acquire a digital still picture through the camera lens. Connect your Movie Camera and personal computer. Next, set the Movie Camera to Camera Mode and open the application.

- In this mode, operate the Movie Camera without a cassette inserted. Otherwise it automatically switches off to conserve battery power.
- In this mode, turn off the Movie Camera's Demonstration Mode.
- The functions of the following on-screen buttons are different from those of the same buttons on the Movie Camera.

1 Point the Movie Camera at the desired object and click [❚❚].

The picture is captured as a still picture.

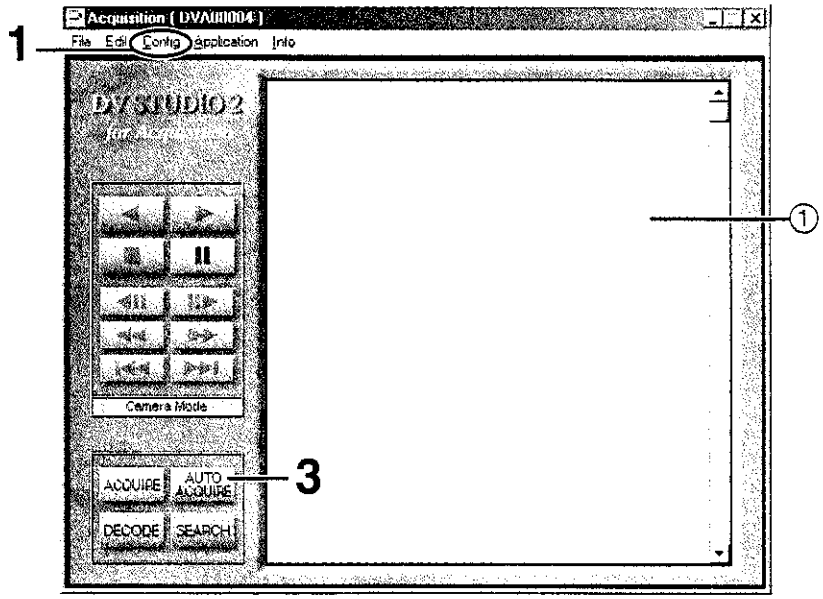
- If you do not like the picture, you can cancel it by clicking the same button again.

2 Click [ACQUIRE].

Picture acquisition now starts. When acquisition is completed, the acquired picture appears on the picture display ①.

- To capture and acquire another picture, click [❚❚] and then repeat steps 1 and 2.
- To cancel an acquisition, click [Cancel].

- Due to the possibility of an incorrect operation, do not operate the movie camera directly when the acquire button has been operated at the DV STUDIO2 end.
- When the Movie Camera is in the Camera Mode, it is not possible to use [Print on Video Printer] in the [File] menu.
- It is not possible to use [Print on Video Printer] and [Search Picture] in the Context Menu.
- When [PROGRESSIVE] in the [CAMERA SETUP] Sub-Menu is set to [AUTO] **(➔ 21)**, the acquired picture has only normal resolution—not the higher "Progressive" resolution.



Automatically acquiring digital still pictures in Camera Mode to create a DV album

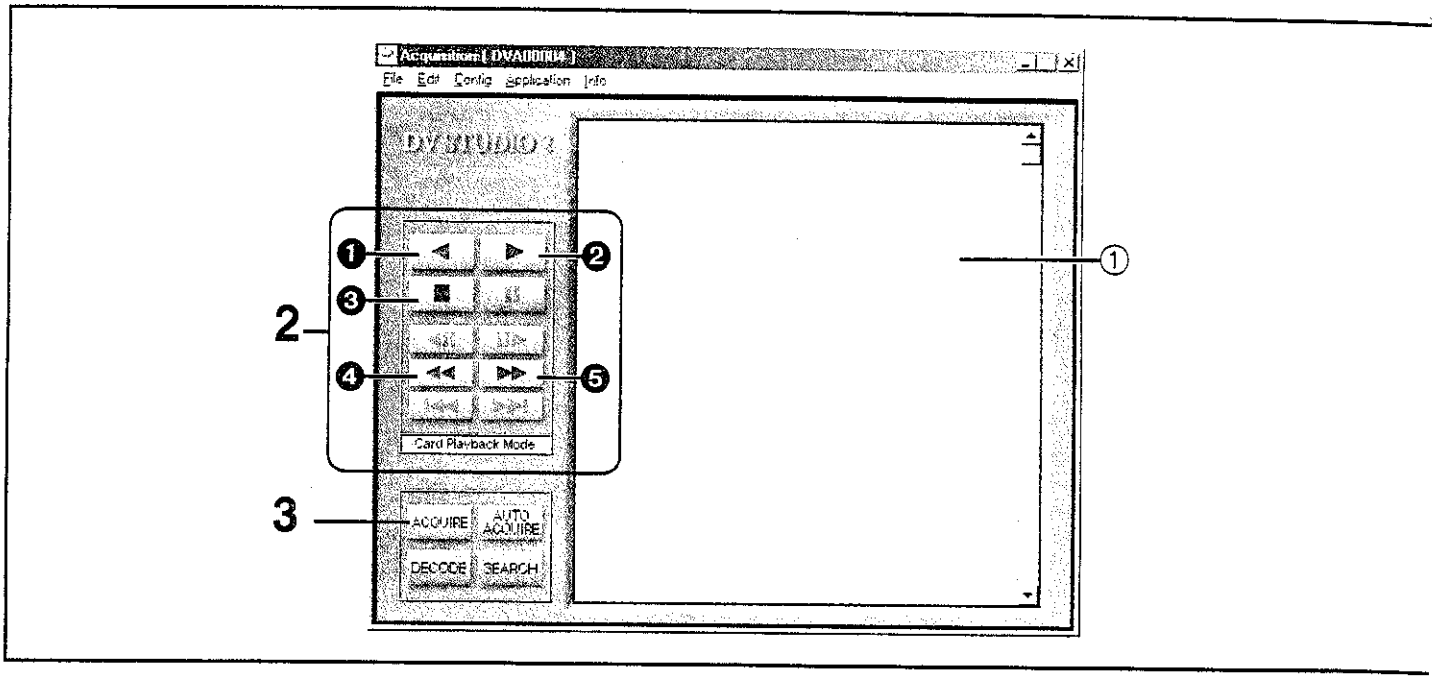
Use the procedure described below to automatically acquire a digital still picture through the camera lens. Connect your movie camera and personal computer. Next, set the movie camera to Camera Mode and open the application.

1 Select the acquisition method under [Auto Acquire Settings] in [Config].
Select the acquisition interval under "Interval Time". The Interval times are subject to slight imprecisions.

2 Point the movie camera at the desired object.

3 Click [AUTO ACQUIRE].
Picture acquisition now starts. Still pictures are acquired at the selected time intervals, and the acquired pictures appear in sequence on the picture display ①.
- To stop auto acquire, click [Cancel].

- Due to the possibility of an incorrect operation, do not operate the movie camera directly when the acquire button has been operated at the DV STUDIO2 end.



Acquiring Card Photoshot pictures to create a DV album

Use the procedure described below to acquire still pictures saved on a MultiMediaCard. Insert the MultiMediaCard containing the desired pictures in your Movie Camera, then connect your Movie Camera and personal computer. Next, set the Movie Camera to Card Playback Mode and open the application.

- In case you cannot perform operations, check if the MultiMediaCard is correctly inserted.

1 Select the desired acquisition format under [Acquire Format] in [Config].

- Select [Full Acquire Mode] or [Fast Preview Mode].

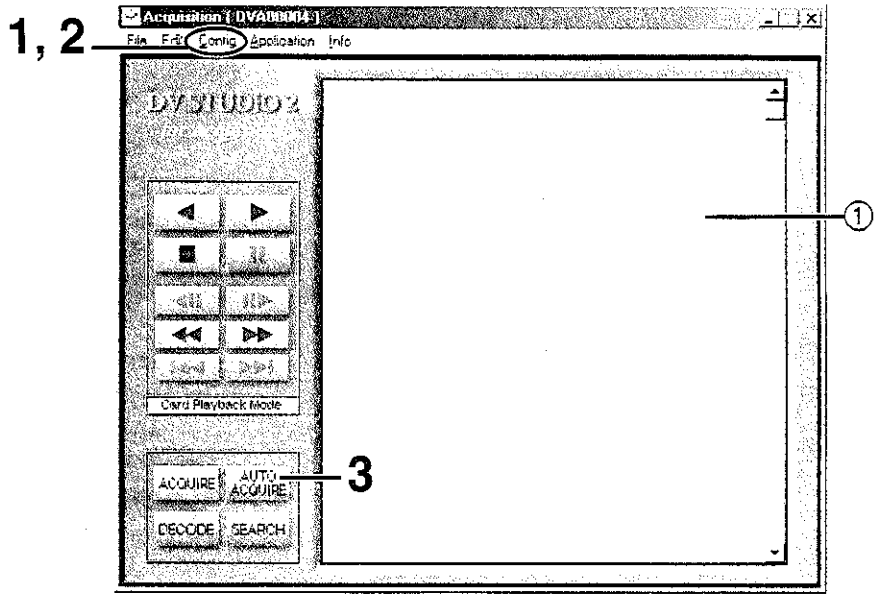
2 Use the movie camera control buttons to find the desired picture.

Click [◀] ❶ or [▶] ❷ to view the pictures one at a time. If the MultiMediaCard contains a large number of pictures, click [■] ❸ to switch to a multi-picture screen. You can then click [◀◀] ❹ or [▶▶] ❺ to view nine pictures at a time.

3 Click [ACQUIRE].

Picture acquisition now starts. When acquisition is completed, the acquired picture appears on the picture display ①.

- To cancel an acquisition, click [Cancel].
- Due to the possibility of an incorrect operation, do not operate the movie camera directly when the acquire button has been operated at the DV STUDIO2 end.
- It is not possible to use [Print on Video Printer] in the Context Menu.



Automatically acquiring Card Photoshot pictures to create a DV album

Use the procedure described below to automatically acquire still pictures saved on a MultiMediaCard. Insert the MultiMediaCard containing the desired pictures in your Movie Camera, then connect your Movie Camera and personal computer. Next, set the movie camera to Card Playback Mode and open the application.

1 Select the desired acquisition format under [Acquire Format] in [Config].

- Select [Full Acquire Mode] or [Fast Preview Mode].

2 Select the acquisition method under [Auto Acquire Settings] in [Config].

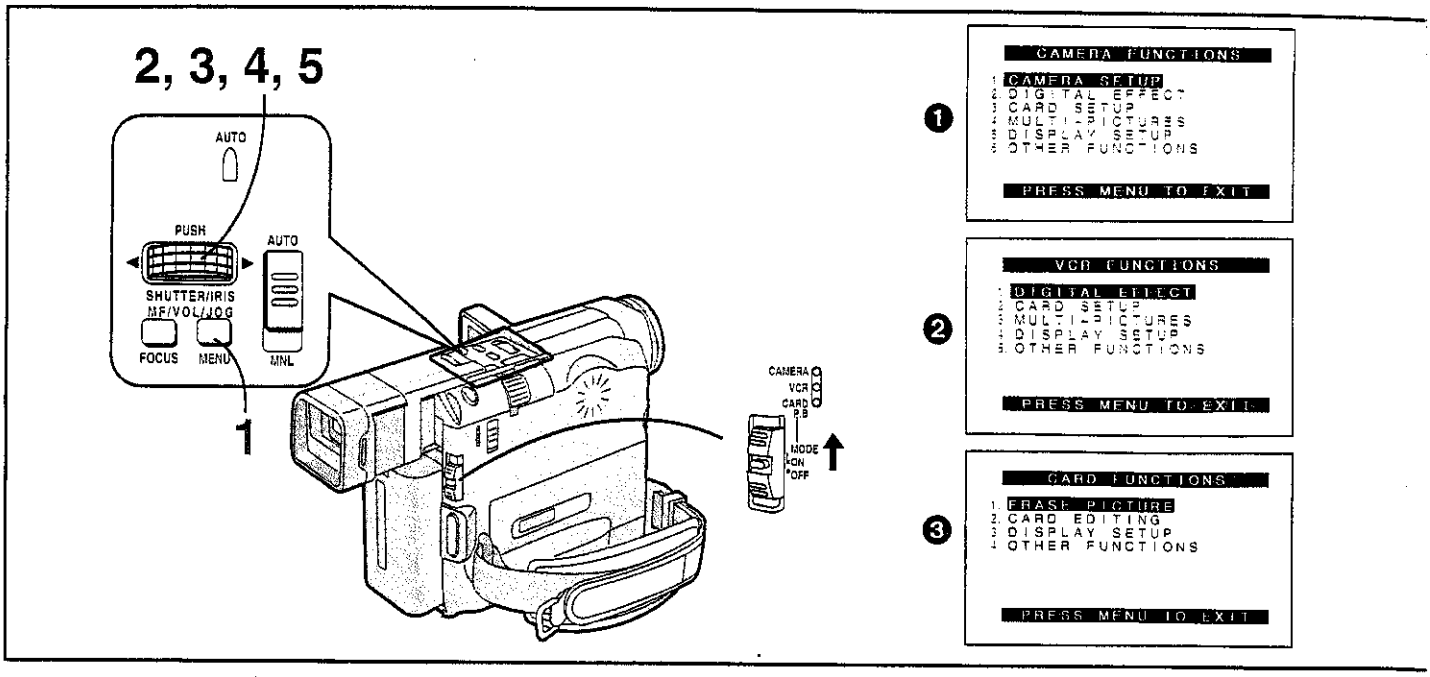
Select [From here] or [From Start Tape].

- If you want to acquire from the first recorded picture on the MultiMediaCard, select [From Start Tape].

3 Click [AUTO ACQUIRE].

Picture acquisition now starts. When acquisition is completed, the acquired pictures appear in sequence on the picture display ①.

- To stop auto acquire, click [Cancel].
- Due to the possibility of an incorrect operation, do not operate the movie camera directly when the acquire button has been operated at the DV STUDIO2 end.
- When you want to decode the picture acquired in the [Fast Preview Mode], click the [■] Button to switch back to the normal single-picture mode before starting the decoding.



Using the Menu Screen

This Movie Camera displays the settings of various functions in Menus to make it easy to select the desired functions and settings.

1 Press the [MENU] Button.

When the [CAMERA] Lamp is lit, Camera Mode Menu ❶ is displayed.
When the [VCR] Lamp is lit, VCR Mode Menu ❷ is displayed.
When the [CARD P.B] Lamp is lit, Card Playback Mode Menu ❸ is displayed.

2 Turn the [PUSH] Dial to select the desired sub-menu.

Turning the [PUSH] Dial changes the highlighted item.

3 Press the [PUSH] Dial to display the selected sub-menu.

4 Turn the [PUSH] Dial to select the item to be set.

5 Press the [PUSH] Dial to set the selected item to the desired mode.

Every press moves the cursor [▶] to the next mode.
Settings for the menu item(s) that cannot be used due to the combination of the selected functions are displayed in dark blue.

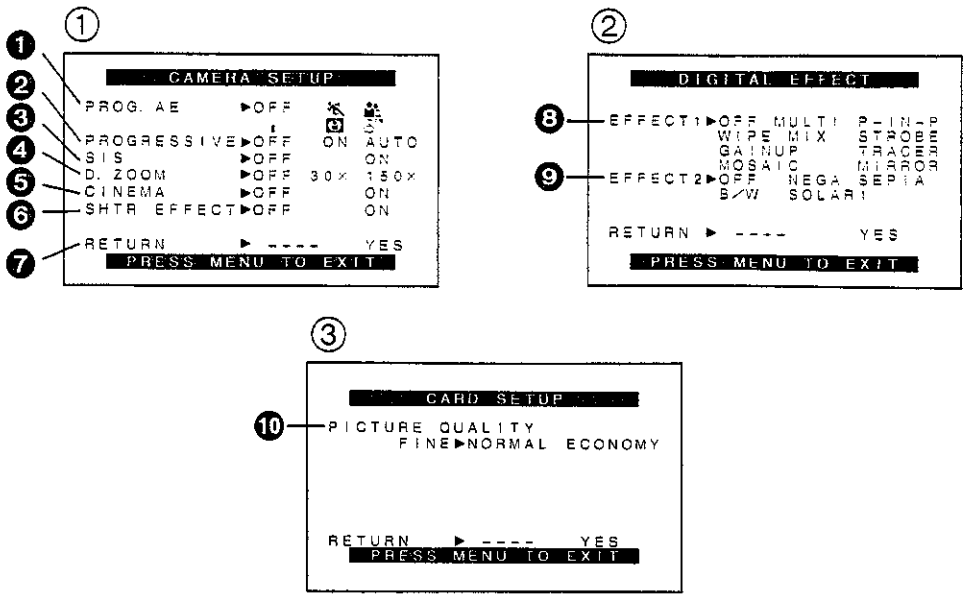
- While the menu is displayed, recording or playback is not possible. During playback, displaying the Menu is possible, but not during recording.
- You can also perform the above operation by using the Remote Controller. **(➔ 72)**

Exiting the Menu

Press the [MENU] Button again.

Note About the Settings Made on the Menu

The settings you selected on the Menu are maintained when you turn the Movie Camera off. However, if you disconnect the power supply unit (Battery or AC Adaptor) from the Movie Camera before turning it off, the selected settings may not be maintained.



Menu Functions

The illustrations of the menus are intended for explaining the functions; the actual menus look somewhat different.

Camera Mode Main-Menu [CAMERA FUNCTIONS]

1. **CAMERA SETUP**
2. **DIGITAL EFFECT**
3. **CARD SETUP**
4. **MULTI-PICTURES**
5. **DISPLAY SETUP**
6. **OTHER FUNCTIONS**

[CAMERA SETUP] Sub-Menu ①

❶ **Auto Exposure Mode [PROG.AE] (➜ 37)**

❷ **Progressive Photoshot Mode [PROGRESSIVE] (➜ 21)**

❸ **Super Image Stabilizer [SIS] (➜ 24)**

❹ **Digital Zoom [D.ZOOM] (➜ 19)**

❺ **Cinema-like Format Recording [CINEMA] (➜ 23)**

❻ **Shutter Effect [SHTR EFFECT] (➜ 20)**

❼ **Returning to the Camera Mode Main-Menu [RETURN]**
If you set [RETURN] to [YES], the menu changes back to the [CAMERA FUNCTIONS] Main-Menu.

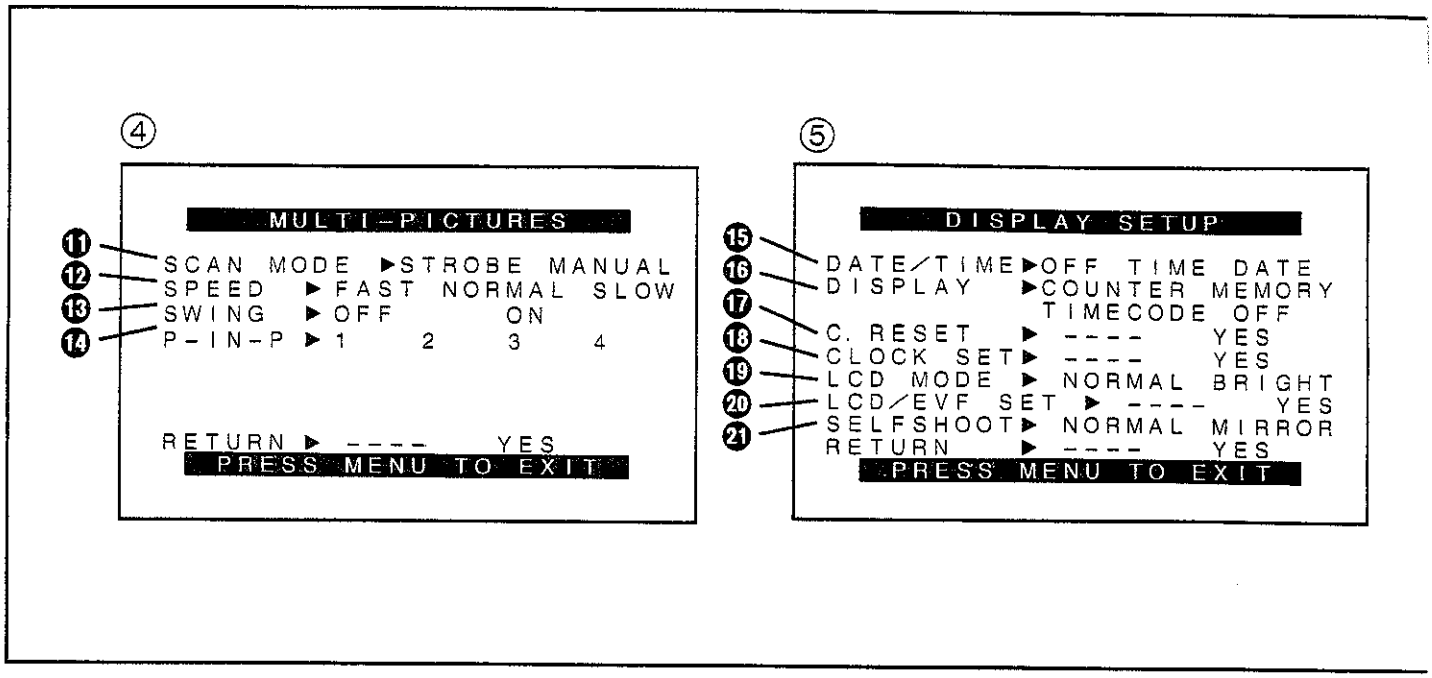
[DIGITAL EFFECT] Sub-Menu ②

❽ **Digital Effects 1 [EFFECT1] (➜ 39)**

❾ **Digital Effects 2 [EFFECT2] (➜ 40)**

[CARD SETUP] Sub-Menu ③

❿ **Picture Quality [PICTURE QUALITY] (➜ 65)**


④
MULTI-PICTURES
⓫ SCAN MODE ▶STROBE MANUAL
⓬ SPEED ▶FAST NORMAL SLOW
⓭ SWING ▶OFF ON
⓮ P-IN-P ▶1 2 3 4
RETURN ▶ ---- YES
PRESS MENU TO EXIT
⑤
DISPLAY SETUP
⓯ DATE/TIME ▶OFF TIME DATE
⓰ DISPLAY ▶COUNTER MEMORY
TIMECODE OFF
⓱ C. RESET ▶ ---- YES
⓲ CLOCK SET ▶ ---- YES
⓳ LCD MODE ▶ NORMAL BRIGHT
⓴ LCD/EVF SET ▶ ---- YES
㉑ SELFSHOOT ▶ NORMAL MIRROR
RETURN ▶ ---- YES
PRESS MENU TO EXIT

Camera Mode Main-Menu [CAMERA FUNCTIONS] (Continued)

[MULTI-PICTURES] Sub-Menu ④

⓫ Multi-Picture Mode [SCAN MODE] (➜ 42, 43)

⓬ Strobe Multi-Picture Speed [SPEED] (➜ 42)

⓭ Swing Mode [SWING] (➜ 42)

⓮ Position of Small Picture inside Normal Picture [P-IN-P] (➜ 45)

[DISPLAY SETUP] Sub-Menu ⑤

⓯ Date and Time Indication [DATE/TIME] (➜ 118)

⓰ Counter Display Mode [DISPLAY] (➜ 118)

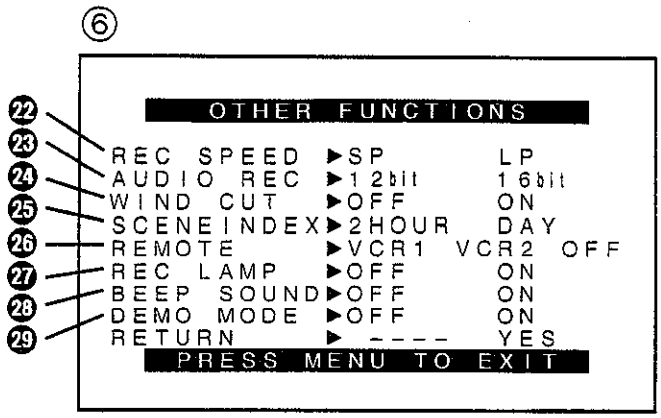
⓱ Counter Reset [C.RESET] (➜ 114)
To reset the counter to zero.
However, the Time Code cannot be reset

⓲ Date and Time Setting [CLOCK SET] (➜ 98)

⓳ LCD Lighting Mode [LCD MODE] (➜ 100)

⓴ LCD and Finder Adjustment [LCD/EVF SET] (➜ 100)

㉑ Self-Recording [SELFSHOOT] (➜ 17)



Camera Mode Main-Menu [CAMERA FUNCTIONS] (Continued)

[OTHER FUNCTIONS] Sub-Menu ⑥

㉒ Recording Speed Mode [REC SPEED] (➜ 12)

㉓ Audio Recording Mode [AUDIO REC] (➜ 61)

㉔ Wind Noise Reduction [WIND CUT]
If you set [WIND CUT] to [ON], the noise of the wind hitting the microphone is reduced. However, this also causes a slight deterioration of the sound reproduction in the bass range.

㉕ Scene Index Mode [SCENEINDEX] (➜ 33)

㉖ Remote Controller Mode [REMOTE] (➜ 77)

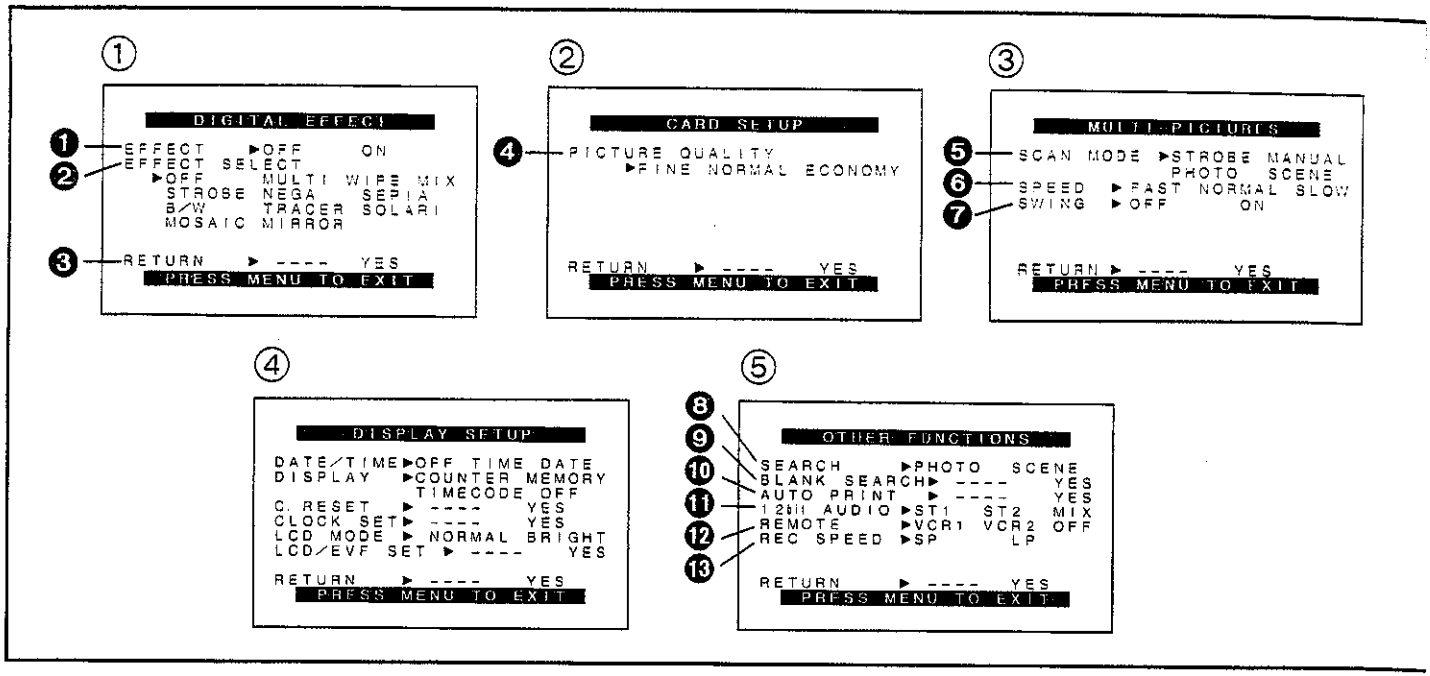
㉗ Recording Lamp [REC LAMP] (➜ 15)

㉘ Beep Sound [BEEP SOUND]
If you set [BEEP SOUND] to [ON], a confirmation/alarm beep sound is emitted in the following cases:
1 Beep
- When you start recording
- When you switch the [OFF/ON/MODE] Switch from [OFF] to [ON]

2 Beeps
- When you pause recording

10 Beeps
- When you operate the Movie Camera in an inappropriate way before or during recording

㉙ Demonstration Mode [DEMO MODE]
If you connect the AC Adaptor to the Movie Camera, set the [OFF/ON/MODE] Switch to [CAMERA] without any cassette inserted, and leave it on for approximately 10 minutes without performing any operation, the Movie Camera automatically switches over to the Demonstration Mode to show its functions.
Pressing a button or performing some other operation suspends the Demonstration Mode. Leaving the Movie Camera again on for more than 10 minutes without operating it, causes the demonstration to start again.
Also, when you set [DEMO MODE] to [ON] and then exit the menu, the demonstration starts.
To cancel the Demonstration Mode, insert a cassette or set [DEMO MODE] to [OFF].



VCR Mode Main-Menu [VCR FUNCTIONS]

1. **DIGITAL EFFECT**
2. **CARD SETUP**
3. **MULTI-PICTURES**
4. **DISPLAY SETUP**
5. **OTHER FUNCTIONS**

[DIGITAL EFFECT] Sub-Menu ①

❶ **Digital Effect Off/On [EFFECT] (➜ 53)**

❷ **Digital Effect Selection [EFFECT SELECT] (➜ 53)**

❸ **Returning to the VCR Mode Main-Menu [RETURN]**
If you set [RETURN] to [YES], the Menu changes back to the [VCR FUNCTIONS] Main-Menu.

[CARD SETUP] Sub-Menu ②

❹ **Picture Quality [PICTURE QUALITY] (➜ 65)**

[MULTI-PICTURES] Sub-Menu ③

❺ **Multi-Picture Mode [SCAN MODE] (➜ 54, 55, 56)**

❻ **Strobe Multi-Picture Speed [SPEED] (➜ 54)**

❼ **Swing Mode [SWING] (➜ 54)**

[DISPLAY SETUP] Sub-Menu ④
All items on the [DISPLAY SETUP] Sub-Menu are the same as those on the [DISPLAY SETUP] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu. **(➜ 94)**

[OTHER FUNCTIONS] Sub-Menu ⑤

❽ **Index Search Mode [SEARCH] (➜ 33, 34, 35)**

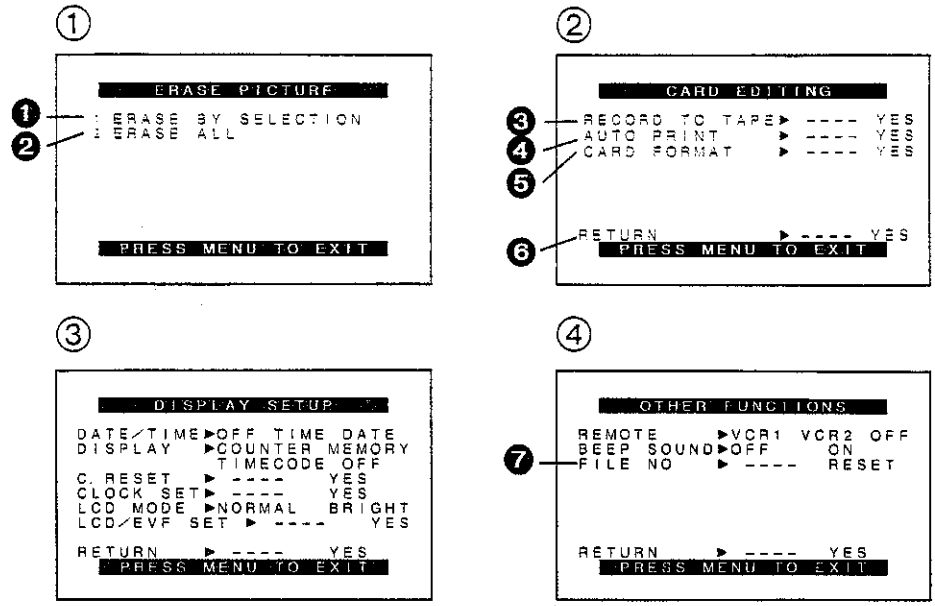
❾ **Blank Search [BLANK SEARCH] (➜ 32)**

❿ **Automatic Printing [AUTO PRINT] (➜ 83)**

⓫ **Audio Output Mode [12bit AUDIO] (➜ 62)**

⓬ **Remote Controller Mode [REMOTE] (➜ 77)**

⓭ **Recording Speed Mode [REC SPEED] (➜ 79)**



Card Playback Mode Main-Menu [CARD FUNCTIONS]

[ERASE PICTURE] Sub-Menu ①

❶ Selecting and Erasing a Picture [ERASE BY SELECTION] (➔ 68)

❷ Erasing All Pictures [ERASE ALL] (➔ 68)

[CARD EDITING] Sub-Menu ②

❸ Recording to Cassette [RECORD TO TAPE] (➔ 70)

❹ Automatic Printing [AUTO PRINT] (➔ 83)
If you connect the Movie Camera to the Digital Video Printer and set [AUTO PRINT] to [YES], all pictures stored on the MultiMediaCard are printed automatically.

❺ Formatting a MultiMediaCard [CARD FORMAT] (➔ 69)

❻ Returning to the Card Playback Mode Main-Menu [RETURN]

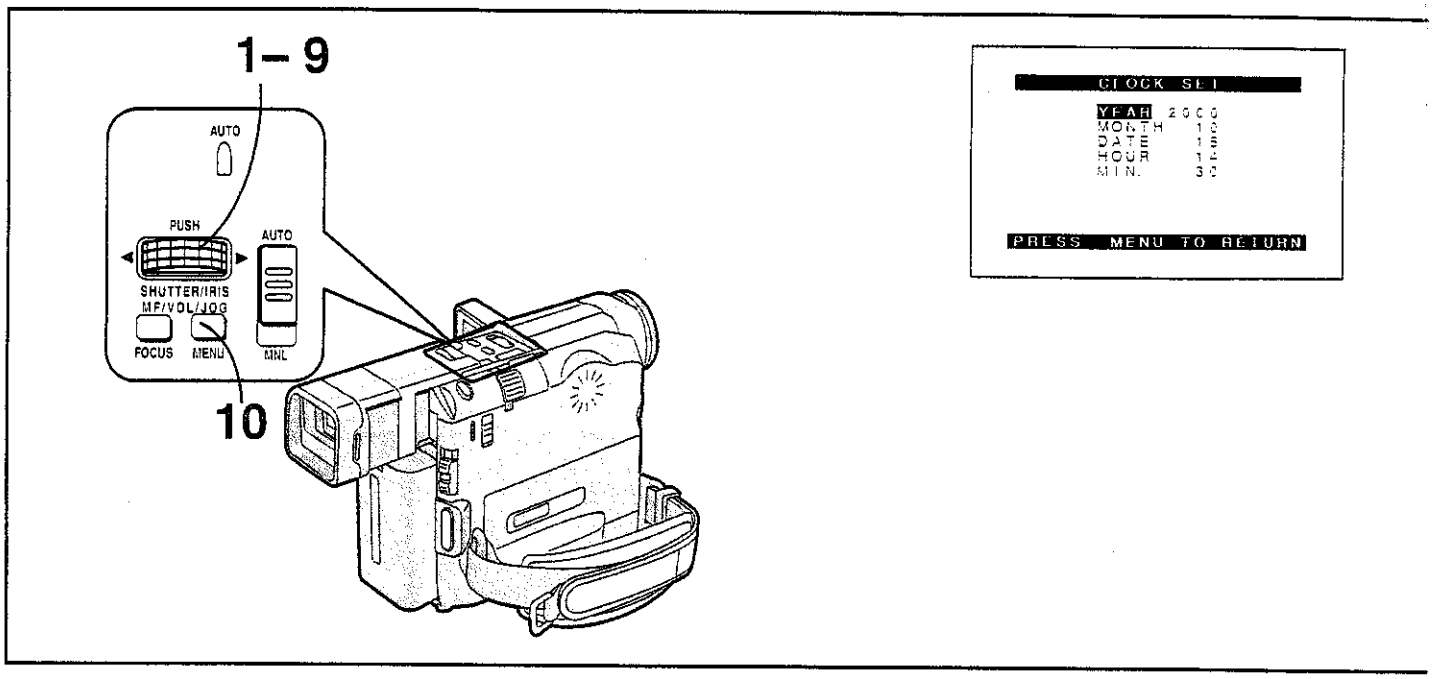
[DISPLAY SETUP] Sub-Menu ③

All items on the [DISPLAY SETUP] Sub-Menu are the same as those on the [DISPLAY SETUP] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu. **(➔ 94)**

[OTHER FUNCTIONS] Sub-Menu ④

❼ File Number Reset [FILE NO] (➔ 69)

All items on the [OTHER FUNCTIONS] Sub-Menu are the same as those on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu. **(➔ 95)**



Setting the Date and Time

If you set [CLOCK SET] on the [DISPLAY SETUP] Sub-Menu to [ON], the menu shown above appears.

For example: To set the clock to 15th October 2000, 14:30

1 **Turn the [PUSH] Dial to set to [2000].**
The years change in the following order:
2000→2001→...→2089→2000→...

2 **Press the [PUSH] Dial to select [MONTH].**

3 **Turn the [PUSH] Dial to set to [10].**

4 **Press the [PUSH] Dial to select [DATE].**

5 **Turn the [PUSH] Dial to set to [15].**

6 **Press the [PUSH] Dial to select [HOUR].**

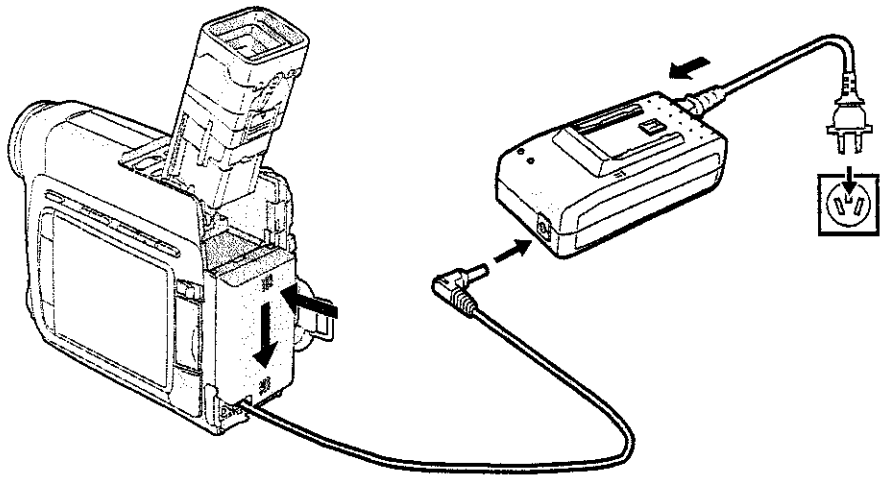
7 **Turn the [PUSH] Dial to set to [14].**

8 **Press the [PUSH] Dial to select [MIN.].**

9 **Turn the [PUSH] Dial to set to [30].**

10 **Press the [MENU] Button to finish the date and time setting.**
The operation of the clock starts from [00] seconds. Pressing the button one more time makes the Menu disappear.

- As the time of the Movie Camera's built-in clock is subject to a slight imprecision, be sure to check the time before recording. If the flashing [⇆] Indication appears, charge the built-in battery (➜ 99) and set the date and time again.
- The clock employs the 24-hour system.



Charging the Built-in Lithium Battery

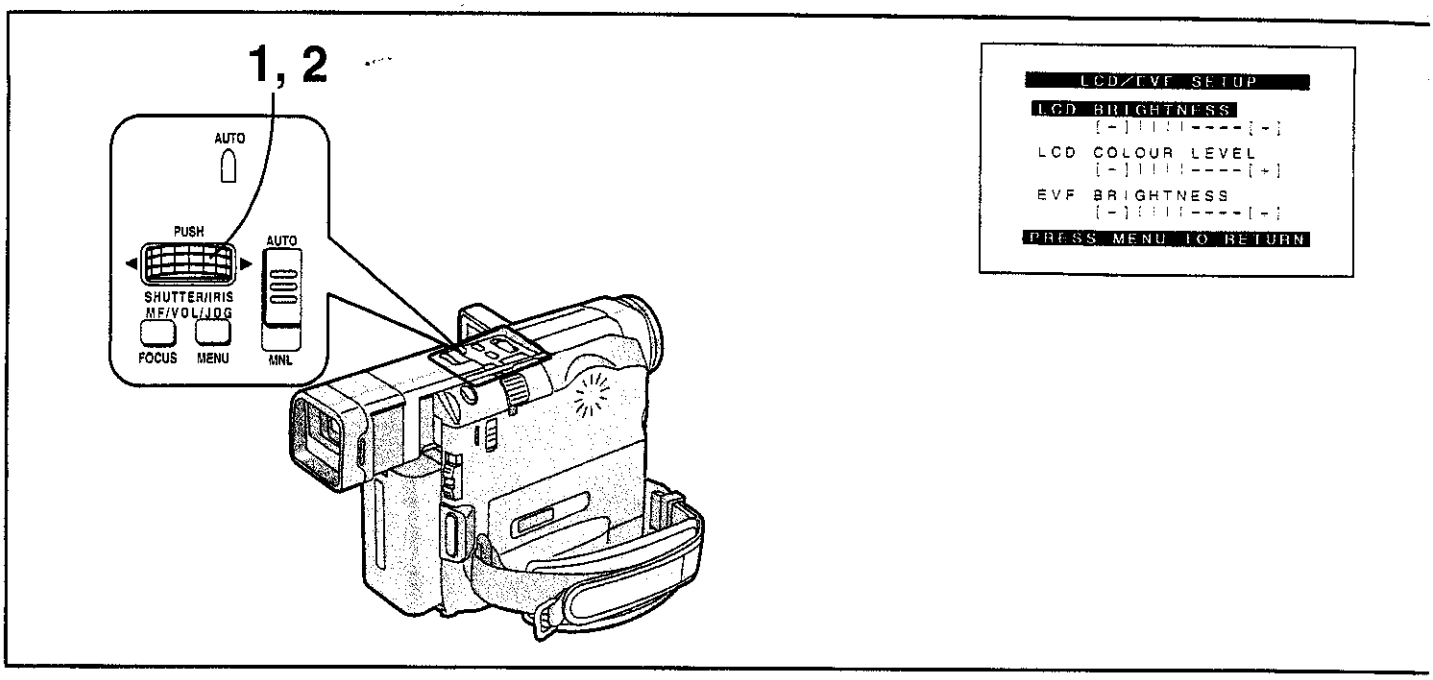
The built-in battery maintains the operation of the clock. When the [⊜] Indication appears, the built-in lithium battery is discharged. Charge the discharged battery in the following way and after charging is finished, set the date and time.

1 **Connect the AC Adaptor to the Movie Camera and to an AC mains socket.** (→ 8)

2 **Leave the Movie Camera turned off.**

3 **Leave the Movie Camera in this condition for approximately 4 hours.**
After charging for 4 hours, the built-in lithium battery can power the clock for approximately 3 months.

WARNING
THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132 600 FOR YOUR NEAREST AUTHORIZED SERVICE CENTRE.



Adjusting the LCD Monitor/Finder

If you set [LCD/EVF SET] on the [DISPLAY SETUP] Sub-Menu of the [VCR FUNCTIONS] or the [CAMERA FUNCTIONS] Main-Menu to [YES], the following items are displayed.

LCD Brightness [LCD BRIGHTNESS]
To adjust the brightness of the LCD screen. The Bar Indicatior is divided into 8 steps. The more vertical bars are shown, the brighter is the screen.

LCD Colour Level [LCD COLOUR LEVEL]
To adjust the colour saturation of the LCD screen. The Bar Indication is divided into 8 steps. The more vertical bars are shown, the stronger are the colours.

Finder Brightness [EVF BRIGHTNESS]
To adjust the brightness of the Finder. The Bar Indication is divided into 8 steps. The more vertical bars are shown, the brighter is the screen.

1 Press the [PUSH] Dial to select the item that you want to adjust.

2 Turn the [PUSH] Dial. Turning it increases or decreases the number of vertical bars of the Bar Indication.

If you use the Remote Controller for these adjustments, press the [ITEM] Button to select the item, and then press the [SET] Button to adjust it. Keeping the [SET] Button pressed changes the number of bars.

Increasing the Brightness of the Whole LCD Monitor Screen
Set [LCD MODE] on the [DISPLAY SETUP] Sub-Menu of the [VCR FUNCTIONS] or the [CAMERA FUNCTIONS] Main-Menu to [BRIGHT].

- These adjustments have no influence on the actually recorded picture.

Cautions for Use

In the event of abnormal operation (e.g. if the unit emits smoke or an unusual smell), immediately stop operating the unit and consult the Panasonic Customer Care Centre on 132 600.

Take care that no water enters the Movie Camera when using it in the rain and snow or on the beach.

- The Movie Camera and the cassette could become damaged. (It might not be repairable.)
- If seawater has accidentally splashed on the Movie Camera, moisten a soft cloth with tap water, wring it well and wipe the camera body carefully with it. Then thoroughly wipe it with a soft, dry cloth.

Keep the Movie Camera away from magnetized equipment (TVs, video games. etc.).

- If you use the Movie Camera on or near a TV, the electromagnetic radiation may cause picture and sound distortion.
- Strong magnetic fields generated by speakers and large motors may damage the recordings on the tape and distort the picture.
- The electromagnetic radiation from micro-processors can adversely influence the Movie Camera and cause picture and sound distortion.
- If the Movie Camera is adversely influenced by magnetized equipment and does not work correctly, turn the Movie Camera off, remove the Battery or disconnect the AC Adaptor and attach the Battery or connect the AC Adaptor again. Then turn the Movie Camera on.

Do not use the Movie Camera near a radio transmitter or high-voltage power line.

- If you record near a radio transmitter or high-voltage power line, the recorded picture and sound may be adversely influenced.

Do not use the Movie Camera for surveillance and other industrial applications.

- If the Movie Camera is being used for a long time, the inside temperature could rise excessively and this may cause malfunction.
- This Movie Camera is not designed for industrial use.

Take care that no sand and fine dust enters the Movie Camera when using it on a beach or similar places.

- Sand and dust could damage the Movie Camera and cassette. (Be careful when inserting and removing the cassette.)

Do not spray insecticide or volatile agents on the Movie Camera.

- Such agents could deform the body and cause the surface coating to peel off.
- Do not leave the Movie Camera in direct contact with rubber or plastic products for a long time.

Do not use benzine or thinner for cleaning.

- They could deform the body and cause the surface coating to peel off.
- Before cleaning, remove the Battery or unplug the AC Mains Lead from the AC mains socket.
- Wipe the Movie Camera with a soft, clean cloth. To remove persistent stains, wipe with a cloth moistened with mild detergent diluted with water, and then finish with a dry cloth.
- When storing or transporting the Movie Camera, place it in a softly padded bag or case to prevent the coating of the camera body from wearing off.

After use, always take out the cassette and remove the Battery or unplug the AC Mains Lead from the AC mains socket.

- If you leave the cassette in the Movie Camera, the tape can become loosened and damaged.
- If you leave the Battery attached to the Movie Camera for a long time, the voltage level may drop excessively so that the Battery cannot be used any more even after charging.

Notes about the AC Adaptor

- After attaching the Battery to the AC Adaptor, the [CHARGE] Lamp flashes for a few seconds while the Battery condition is being checked. After that, the [CHARGE] Lamp automatically lights and charging starts.
- If the temperature of the Battery is extremely high or extremely low, the [CHARGE] Lamp may keep on flashing and charging is not possible. After the Battery has cooled down or warmed up sufficiently, charging starts automatically.
  However, if the [CHARGE] Lamp continues to flash after the Battery has cooled down or warmed up sufficiently, some malfunction may have occurred in the Battery or in the AC Adaptor. In this case, consult with your dealer.
- When the battery is warm, charging takes longer than usual.
- When you use the AC Adaptor near a radio, the radio reception may be distorted. Keep the AC Adaptor more than 1 metre away from the radio.
- When the AC Adaptor is in use, it may emit a whirring sound However, this is normal.
- After use, be sure to disconnect the AC Mains Lead from the AC mains socket. (If you leave it connected, small amount of electricity is consumed.)
- Always keep the terminals of the AC Adaptor and the battery clean.

■ Condensation

Determining Whether Condensation Has Formed Inside and Remedy for Condensation

If the Condensation Indication flashes after you turn on the Movie Camera, condensation has formed inside the Movie Camera. In this case, the Movie Camera automatically switches off after approximately 1 minute.
Remedy as follows:

1 Take out the cassette.

All other functions do not work. Depending on the amount of condensation, it may not be possible to take out the cassette. In this case, wait 2–3 hours before taking out the cassette.

2 Leave the Cassette Compartment open and wait for 2–3 hours.

The required time depends on the amount of condensation and the ambient temperature.

3 After 2–3 hours, turn the Movie Camera on and check if the Condensation Indication is not displayed.

Even if the Condensation Indication is no longer displayed, wait 1 more hour for added safety before using the Movie Camera again.

Pay Attention to Condensation Even Before the Condensation Indication Appears.

- As condensation forms gradually, the Condensation Indication may not appear for the first 10–15 minutes after condensation has formed inside.
- In an extremely cold place, the condensation could freeze and turn into frost. In such a case, it takes an additional 2–3 hours for the frost to first melt into condensation and then to be dissolved.

Remedy for a Fogged-up Lens

Set the [OFF/ON/MODE] Switch to [OFF] and leave the Movie Camera in this condition for about 1 hour. When the lens has reached about the same temperature as its surroundings, it automatically clears up.

■ Video Head Clogging and Remedy

When the video heads (which contact the tape) are dirty, the playback picture contains mosaic-like patterns or the whole screen becomes black. If they become even more dirty, the recording performance deteriorates and in the worst case, recording may not be possible at all.

Causes of Dirty Video Heads

- A lot of dust in the air
- High-temperature and high-humidity environment
- Damaged tape
- Long-time use

Using the Mini-DV Format Digital Video Head Cleaner

1 **Insert the Head Cleaner into the Movie Camera in the same way as a video cassette.**
2 **Press the Play Button [▶], and after approximately 20 seconds press the Stop Button [■]. (Do not rewind the tape.)**
3 **Take out the Head Cleaner. Insert a video cassette, perform recording and then play it back to check the picture.**
4 **If the picture is still not clear, repeat above operation steps 1–3. (Do not use the Head Cleaner more than 3 times in succession.)**

Notes:

- Do not rewind the tape in the Head Cleaner after every use. Rewind it only after the tape has reached its end, and then use it again in the same way from the beginning.
- If the video heads again become clogged with dirt soon after cleaning, this might be caused by a damaged tape. In this case, stop using that cassette immediately.
- Be careful not to clean the video heads too much. (Too much cleaning could cause excessive wear to the video heads. If the video heads get worn, the picture is not played back clearly even after cleaning.)
- If using the Head Cleaner does not clear the video head clogging, the Movie Camera requires cleaning or repairing by a service centre.
  Please consult with your dealer.
- This Video Head Cleaner is available from service centres.
- Video head cleaning due to clogging is not a malfunction of the product and is not covered by your warranty.

Periodic Inspection

To ensure optimum picture quality, we recommend that you have worn-out parts such as video heads replaced after approximately 1000 hours of use. (However, this depends considerably on the conditions of use such as temperature, humidity and dust.)

■ Optimum Use of the Battery

Special Characteristics of the Battery

This Battery is a rechargeable lithium-ion battery. Its ability to generate electric energy is based on an internal chemical reaction. This reaction is easily influenced by ambient temperature and humidity, and the useful operation time that the Battery can provide becomes shorter at high and low temperatures. When used in extremely cold surroundings, the Battery may only be able to provide approximately 5 minutes of operation time. If the Battery becomes extremely hot, a protection function is activated and prevents the use of the Battery for some time.

After Use, Always Remove the Battery.

Be sure to remove the Battery from the Movie Camera. (If it is attached to the Movie Camera, a small amount of electric current is consumed even if the Movie Camera is turned off.) Leaving the Battery attached to the Movie Camera for a very long time could cause it to become excessively discharged, so that it cannot be used any more even after charging.

Keep the Battery's Terminals Clean.

Be careful that the terminals do not get plugged up with dust, dirt or other substances.
If you accidentally drop the Battery, confirm that the Battery itself and the terminals are not deformed.
Attaching a deformed Battery to the Movie Camera or to the AC Adaptor could damage the Movie Camera or the AC Adaptor.

Discarding a Battery That Has Become Unusable

- The usable life of the Battery is limited.
- Do not throw the Battery in a fire because it could explode.

■ Precautions for Storage

Before Storing the Movie Camera, Take out the Cassette and Remove the Battery.

Store all equipment in a dry place where the temperature remains relatively constant.
(Recommended temperature is 15°C–25°C and recommended relative humidity is 40%–60%.)

Movie Camera

- Wrap it with a soft cloth to prevent dust from entering.
- Never leave the Movie Camera in places with high temperature.

Battery

- Extremely low or high temperature shortens the Battery life.
- Storing it in places with oily smoke and a lot of dust could cause the terminals to get rusty, and this can result in malfunction.
- **Do not allow metal objects (such as necklaces and hair pins) to touch the battery terminals. Short-circuiting may occur and generate heat, and touching it in this condition could inflict serious burns.**
- Store the Battery in discharged condition. If you store the Battery for a long time, we recommend that you charge it once a year and completely use up the charge before storing it again in discharged condition.

Cassette

- Rewind the tape to its beginning before storing.
  Leaving the cassette with the tape stopped halfway for more than 6 months (depending on the storing condition) loosens the tape. Be sure to rewind it to the beginning.
- Put the cassette in its case to store it.
  Dust, direct sunlight (ultraviolet rays) and humidity could damage the tape. Dust contains hard mineral particles and cassettes with dust damage the video heads and other parts of the Movie Camera. Make it a habit to always put the cassette back into its case.
- Completely wind the tape forward and then rewind it once every half year. Leaving the cassette for more than a year without winding/rewinding it may deform the cassette because of stretching and shrinking of the tape due to changes in temperature and humidity. Also, the tape may stick together.
- Do not place the cassette near strongly magnetized objects or equipment.
- The tape surface is coated with microscopic magnetic particles and they record signals. Such objects as magnetic necklaces and toys have stronger magnetic force than commonly thought, and this could erase the recorded contents and cause noise in picture and sound.

MultiMediaCard

While the MultiMediaCard is being read, do not remove it, turn off the power, or subject it to vibrations and shocks.
Do not leave the MultiMediaCard in a place with high temperature, exposed to direct sunlight, or where electromagnetic waves and static electricity can be generated.
Do not bend or drop the MultiMediaCard as this could damage the MultiMediaCard or the stored contents.

After use, be sure to remove the MultiMediaCard from the Movie Camera.
After using the MultiMediaCard or when storing or carrying it, put it in the supplied MultiMediaCard Case.
Do not touch the connector on the rear edge of the MultiMediaCard with your fingers and take care that no dirt, dust or water enters it.

■ Other Useful Information

LCD Monitor

- In places where big changes in temperature occur, condensation may form on the LCD Monitor. Wipe it with a soft, dry cloth.
- If the Movie Camera is very cold when it is turned on, the picture on the LCD Monitor is initially a little darker than normally. However, as the internal temperature rises, the LCD Monitor regains its normal brightness.
- Extremely high precision technology is employed to produce the LCD Monitor screen featuring a total of approximately 200,000 pixels. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.

Finder

- Extremely high precision technology is employed to produce the Finder screen featuring a total of approximately 166,000 pixels. The result is more than 99.99% active pixels, with a mere 0.01% of the pixels inactive or always lit. However, this is not a malfunction and does not affect the recorded picture.
- Do not leave the Finder or the Lens aimed at the sun. This could seriously damage internal parts.

Lens Hood

- Never try to attach any conversion lens onto the front of the Lens Hood; it does not have a threaded mount on the front.
- When you want to attach the Tele Conversion Lens VW-LT3014E (optional), Wide Conversion Lens VW-LW3007E (optional), MC Protector VW-LMC30E (optional) or ND Filter VW-LND30E (optional), first remove the Lens Hood. (When you push the [W/T] Zoom Lever toward [W] after attaching the filter or conversion lens, the four corners of the picture may become dark (vignetting effect).)
- When you have attached the above ND Filter or MC Protector, you can also attach the Lens Hood onto it. It may not be possible to attach other ND filters and MC protectors to the lens.
- If you attach both the ND Filter and a Conversion Lens, the four corners of the picture may become dark (vignetting effect).

Shoe Adaptor

- If you want to attach the External Microphone (VW-VMS1E; optional), etc. to the Movie Camera, the Shoe Adaptor (VW-SK11E; optional) is necessary.

■ Listening to the Playback Sound via Headphones

You can connect the headphones in the following 2 ways:

- By connecting the headphones to the Headphone Conversion Adaptor (VW-CH1E; optional) connected to the [AV OUT] Socket on the Movie Camera. In this case, disconnect the Output Terminal Box [AV ONE TOUCH STATION].
- By connecting the headphones to the [PHONE] Socket on the Output Terminal Box [AV ONE TOUCH STATION].

Microphone Socket

- If you want to perform audio dubbing via an external microphone or audio equipment, connect it to the [MIC] Socket. In this case, the Movie Camera's built-in microphone is turned off.

Glossary

■ Digital Video System

In the digital video system, picture and sound are converted into digital signals and recorded onto the tape.
This completely digital recording allows recording and playback of picture and sound with minimum quality deterioration.
In addition, such data as Time Code, Date and Time are also automatically recorded as digital signals.

Features

- Superior picture resolution
- Excellent signal-to-noise ratio
- Stable pictures
- Minimised quality deterioration in dubbing
- Minimised cross colour distortion
- PCM digital sound
- No picture deterioration in LP Mode
- 6.35 mm-wide tape
- Compact cassette with long recording time
- Minimised quality deterioration in editing
- Time Code editing

Compatibility with S-VHS or VHS Cassettes

As this Movie Camera uses a digital method for recording picture and sound, there is no compatibility with conventional S-VHS or VHS video equipment using analog recording methods.
In addition, the size and shape of the cassette are completely different.

Compatibility with Output Signals

As the video and audio signals output from the audio and video output sockets are analog—the same as in conventiona video systems—you can connect this Movie Camera to your S-VHS or VHS VCR or TV for playback.

PCM Digital Sound

For recording of the sound, this Movie Camera offers the choice between two different PCM Audio Recording Modes.

- 16 bit, 48 kHz, 2 channels
- 12 bit, 32 kHz, 4 channels

The "16 bit, 48 kHz, 2 channels" Mode offers superior recording sound quality.
The "12 bit, 32 kHz, 4 channels" Mode lets you record the original sound in stereo on two channels and the dubbed sound in stereo on two separate channels.

Sub Code

The digital recording system offers the added capability of recording sub code containing various data.
The following data is recorded as sub code on this Movie Camera:

- Time code
- Recording date and time
- Index signals for locating still images recorded in the Photoshot Mode
- Index signals for locating the beginning of scenes marked with index signal

■ Focus

If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible. Being focused or in focus means that the subject can be seen with optimum clarity and sharpness.

Human Eyes

Human eyes have lenses as well, and when we look at objects at different distances, the shape of these lenses changes automatically so that we can always see these objects clearly.

Movie Camera

The image of the subject enters the Movie Camera through the lens and is converted into an electric signal (video signal) for recording onto magnetic tape. The focus is adjusted either manually or automatically by moving a focusing lens.

Auto Focus Adjustment

The Auto Focus System automatically moves the internal focusing lens forward or backward and adjusts the focus so that the subject can be seen clearly.
The Auto Focus Adjustment has the following characteristics:

- It adjusts until the vertical contours of the subject are as sharp and clean as possible.
- It adjusts the focus on the subjects with strong contrast.
- It adjusts the focus on the subject in the centre of the LCD Monitor or Finder.
  Unlike human eyes, the lens of the Movie Camera cannot instantaneously change the focus from a nearby to a distant subject and vice versa.

Lens Unit

The lens construction used in this Movie Camera generates some clicking noise if the Movie Camera is rocked up and down while it is turned off. This is not a malfunction of the lens unit. This noise does not occur when the Movie Camera is turned on.

For the following subjects and recording situations the Auto Focus System cannot provide precise adjustment.
Use the Manual Focus Mode instead. (→ 50)

❶ **Recording subjects with a part of it near the Movie Camera and another part far away from it**
As the Auto Focus adjusts on the centre part of the image, it is often impossible to bring the nearby and distant parts of the subject into focus.
When you want to record a person with a distant mountain in the back, it is not possible to focus on both.

❷ **Recording subjects behind glass covered with dirt or dust**
As the focus is adjusted on the dirty glass, the subject behind the glass is out of focus. When recording a subject across a street on which cars are running, the focus may be adjusted on the cars.

❸ **Recording subjects in dark surroundings**
As the amount of light information entering through the len is greatly reduced, the Movie Camera cannot adjust the focus precisely.

❹ **Recording subjects surrounded by objects with shiny surfaces or much light reflection**
As the Movie Camera adjusts the focus on objects with shiny surfaces or much light reflection, the subject may go out of focus.
Therefore, when recording at a lake or the sea, evening scenes, fireworks, or under special types of lighting, the subject may be out of focus.

❺ **Recording fast-moving subjects**
As the internal focusing lens is moved mechanically, it cannot follow fast-moving subjects without delay.
Therefore, subjects like children running back and forth may temporarily go out of focus.

❻ **Subjects with weak contrast**
As the Movie Camera adjusts the focus based on vertical contours in the picture, subjects with little contrast such as a white wall may be out of focus.

■ White Balance Adjustment

While most recording with a Movie Camera is probably done outdoors under sunlight, video recording is also done very often under artificial light sources, both indoors and outdoors. However, each of these light sources gives the subject slightly different colours.

Human Eyes

Human eyes can easily adjust to different kinds of lighting and see an object with the same colours even under different lighting.

Movie Camera

Unlike human eyes, the Movie Camera does not have the innate ability to adapt to changes in lighting, and they influence the colours being recorded. Therefore, depending on the light source, the picture would be recorded with a bluish or reddish tint. To minimise the influence of the lighting on the colours of the subject, an adjustment called White Balance Adjustment is necessary.

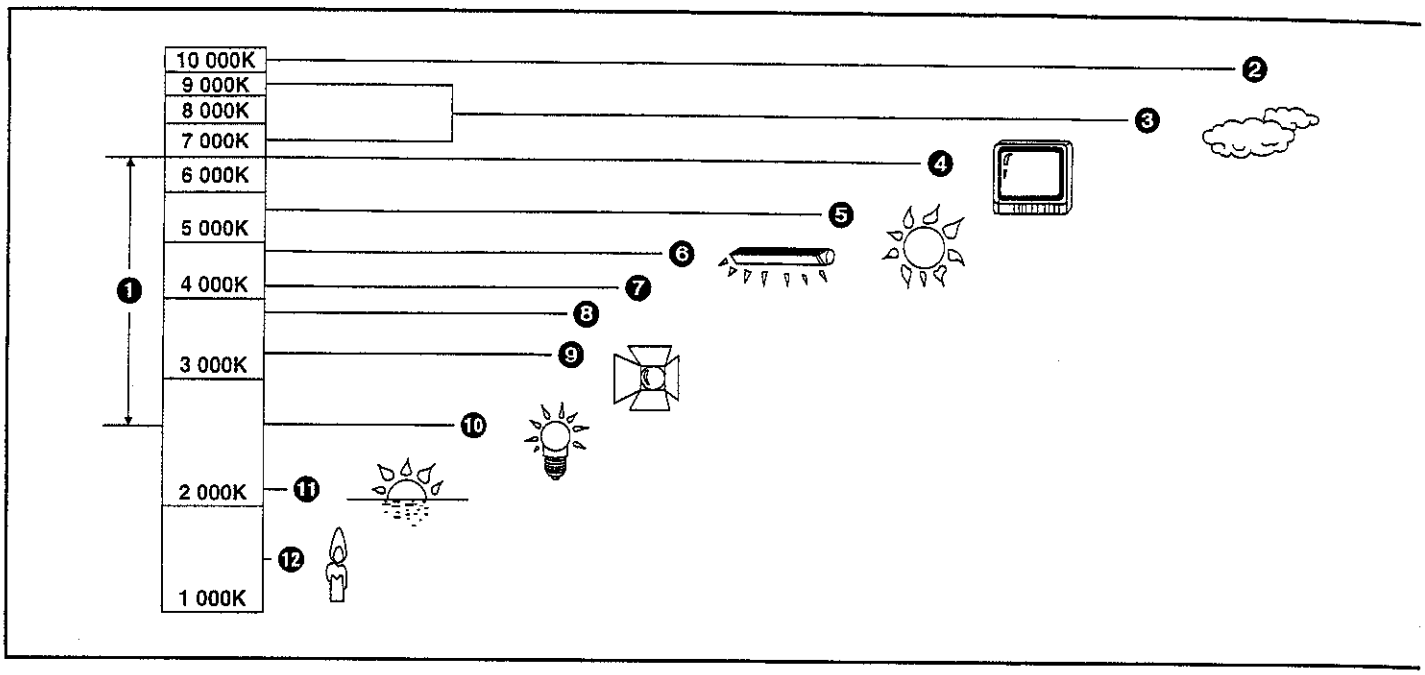
White Balance Adjustment

The White Balance Adjustment determines the colour of the light and adjusts the colours so that white remains pure white. As white is the basic colour of the entire colour spectrum, if white is reproduced correctly, the other colours are correct and natural, too.

Auto White Balance Adjustment

This Movie Camera stores the optimum settings for several common light sources in memory. The Movie Camera judges the recording situation by determining the tint of the light received through the lens and by the White Balance Sensor **(➔ 6)**, and it selects the setting for the most similar tint. This function is called Auto White Balance Adjustment.
However, as the white balance settings for only a few light sources are stored in memory, the white balance is not correctly adjusted for other lighting conditions.

For the range of different types of lighting within which the Auto White Balance Function can provide precise adjustment, refer to the chart **(➔ 112)**. For recording under lighting conditions outside this range, the Auto White Balance Function does not work correctly, and the recorded picture has a red or blue cast. However, the same also applies, if the subject is lit by more than one light source, even if these light sources are within this range.



■ Colour Temperature

Every light source has its own colour temperature measured in Kelvin (K). The higher the Kelvin value, the more bluish the light; the lower the value, the more reddish the light. The Kelvin value is related to the tint of the light, but not directly to its brightness.

The range ❶ indicated in the illustration above shows the light sources for which this Movie Camera can provide precise white balance adjustment and, therefore, natural colours in the recorded pictures, when using the Full Auto Mode. For light sources outside this range, adjust the white balance manually **(➔ 49)**. Also, additional lighting may be necessary.

❶ Control range of this Movie Camera's Auto White Balance Adjustment Mode

❷ Blue sky

❸ Cloudy sky (Rain)

❹ TV screen

❺ Sunlight

❻ White fluorescent lamp

❼ 2 hours after sunrise or before sunset

❽ 1 hour after sunrise or before sunset

❾ Halogen light bulb

❿ Incandescent light bulb

⓫ Sunrise or sunset

⓬ Candlelight

■ Progressive Photoshot Function

This function lets you record still pictures with higher resolution, finer details and smoother image contours than the normal Photoshot Function.

- Usually, still pictures recorded with single-CCD Movie Cameras are field still pictures, whose vertical resolution is approximately half of that of frame still pictures, and picture details are not very precise. (1 frame consists of 2 fields.)
- When recording moving objects, there is a slight difference between two fields. If these field still pictures are recorded as a frame still picture, it will have broken up image contours.
- To record still pictures with smooth contours in excellent picture quality, this Movie Camera is equipped with the Progressive Photoshot Mode featuring:
  an iris that closes like a shutter
  2 field memories

Actual operation:

- Pressing the [PHOTO SHOT] Button
- Closing the iris instantaneously to prevent the next image from entering through the lens
- Storing the same picture data in 2 field memories

As a result, the recorded frame is made up of two fields taken at exactly the same time, and the resolution is approximately 50% higher to ensure a picture with smooth contours.

Notes about the Progressive Photoshot Function

Pressing the [PHOTO SHOT] Button in the Progressive Photoshot Mode records a frame still picture.
However, when [PROGRESSIVE] on the [CAMERA SETUP] Sub-Menu is set to [ON], the following functions cannot be used:

- Digital Zoom
- Digital Effect Mode in [EFFECT1]
- Shutter speeds of 1/750 s or faster
- Continuous Photoshot (Also not possible when [PROGRESSIVE] is set to [AUTO].)

As still pictures recorded in the Progressive Photoshot Mode are extremely sharp and brilliant, they are highly suitable for printing on a Video Printer and for importing into a computer.

When you press the [PHOTO SHOT] Button in the Progressive Photoshot Mode, a click sound can be heard. This is caused by the closing of the iris and is not an indication of malfunction.

- During normal recording, the Progressive Photoshot Funciton cannot be used.

■ Time Code

Time Code signals are the data which indicates the time in hours, minutes, seconds and frames (25 frames/sec). Having this data included in the recording gives every single picture on the tape its own address.

- The Time Code is automatically recorded as part of the sub code with every recording you make.
- When you insert a new (previously unrecorded) cassette, the Time Code automatically starts from zero. If you insert a recorded cassette, the Time Code continues where the time code of the last previous scene stopped. (In this case, the zero indication [0h00m00s00f] may appear after inserting the cassette, but when the recording starts, the Time Code records from the previous value.)
- You cannot reset the Time Code to zero.
- In playback modes other than the Normal Playback Mode, the Time Code may not be displayed (or not be correct).
- Unless the Time Code is recorded continuously from the beginning of the tape, precise editing may not be possible. To ensure that the Time Code is recorded without interruption, we recommend that you use the Camera Search Function **(➔ 31)** or Blank Search Function **(➔ 32)** before starting to record a new scene.

■ Memory Stop Function

The Memory Stop Function is convenient for the following operations.

Rewinding or fast-forwarding the tape to a desired position

1 **Reset the Tape Counter to zero at the tape position from which you want to play back later.** (➔ 94)

2 **Set [DISPLAY] on the [DISPLAY SETUP] Sub-Menu to [MEMORY].**

3 **Start playback or recording.**

4 After playback or recording is finished:
Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode.

5 **Rewind the tape.**
The tape automatically stops approximately at the position at which you reset the counter to zero.

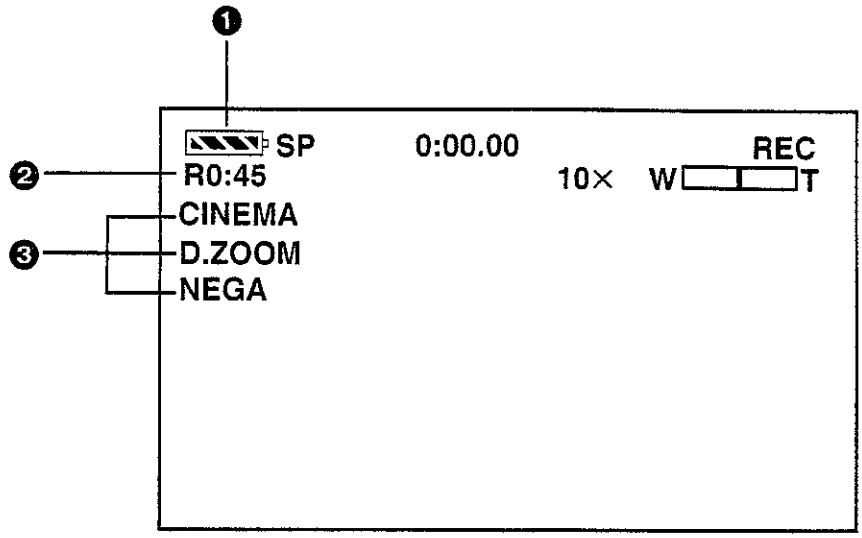
Stopping the editing automatically in audio dubbing

1 **Reset the Tape Counter to zero at the tape position at which you want the editing to stop.**

2 **Set [DISPLAY] on the [DISPLAY SETUP] Sub-Menu to [MEMORY].**

3 **Play back a still picture at the point at which you want the audio dubbing to start.**

4 **Start the audio dubbing.** (➔ 61)
The audio dubbing automatically stops approximately at the position at which you reset the counter to zero.



Indications on the LCD Monitor/in the Finder

❶ **Remaining Battery Power**
As the remaining battery power decreases, the indication changes as follows:
→ → → →
When the battery is completely discharged, the ( ) Indication flashes.
(When you are using the AC Adaptor, the Indication may appear, however, this has no meaning in this case.)

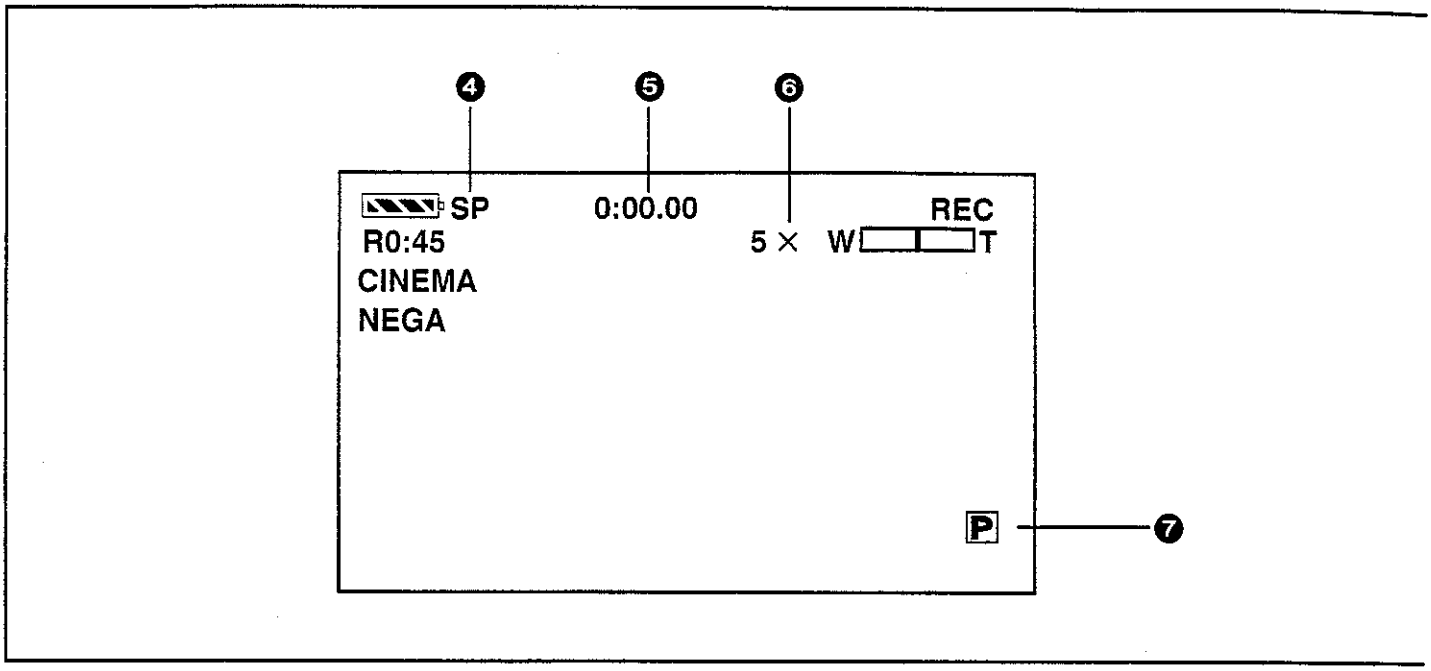
❷ **Remaining Tape Time**
The remaining tape time is displayed in minutes. (When it becomes less than 3 minutes, the indication starts to flash.)
- If a recording lasts less than 15 seconds, the remaining tape time cannot be displayed correctly.
- The displayed remaining tape time may be shorter than the actual remaining tape time.

❸ **Cinema Mode (→ 23)**
When recording in the Cinema Mode, this indication is displayed.

Digital Zoom (→ 19)
When the Digital Zoom Function is activated, this indication is displayed.

Playback Zoom (→ 60)
When the Playback Zoom Function is activated, this indication and the zoom magnification are displayed.

Digital Effects (→ 39, 40)
When a digital effect is activated, the corresponding indication is displayed.



❹ **Recording Speed Mode (➜ 12, 79)**
The selected Recording Speed Mode is displayed.
SP: Standard Mode
LP: Long-play Mode

❺ **Tape Counter, Time Code (➜ 118)**
The Tape Counter, Memory Stop Function or Time Code Indication is displayed.

❻ **Zoom Magnification (➜ 18)**
When you push the [W/T] Zoom Lever up or down, the Zoom Magnification Indication and the Zoom Gauge are displayed.

Recording Mode (➜ 15, 37, 48, 49, 50, 51, 52)

AUTO:	This appears when the Mode Selector Switch is set to [AUTO].
MNL:	This appears when the Mode Selector Switch is set to [MNL].

Super Image Stabilizer (➜ 24)

:	When the Super Image Stabilizer Function is activated, this indication is displayed.

Audio Recording Mode (➜ 61)

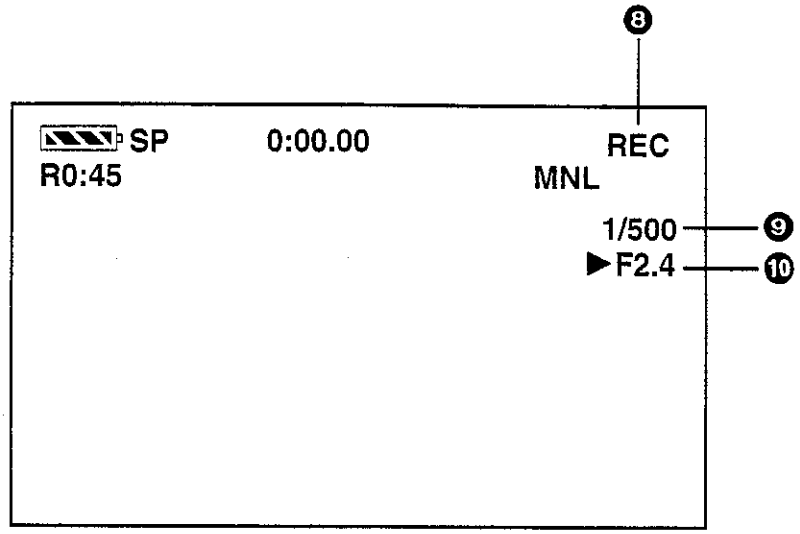
12 bit/16 bit:	The indication of the Audio Recording Mode that was selected for recording is displayed during playback.

Automatic Printing (➜ 83)

AUTOPRINT:	This indication is displayed when the Aut Printing Function is being used.

❼ **Progressive Photoshot Mode (➜ 21)**

P:	This indication is displayed when the Progressive Mode is activated.



⑧ Tape Run Indications

REC:	Recording **(➜ 15)**
PAUSE:	Recording Pause **(➜ 15)**
▷:	Playback **(➜ 25)**/Camera Search in forward direction **(➜ 31)**
◁:	Camera Search in reverse direction **(➜ 31)**
❚❚:	Still Playback **(➜ 28)**
▷▷:	Fast-forward/Cue Playback **(➜ 26)**
◁◁:	Rewind/Review Playback **(➜ 26)**
▮▷/◁▮:	Slow Playback in forward direction/Slow Playback in reverse direction **(➜ 27)**
❚❚▷/◁❚❚:	Still Advance Playback in forward direction/ Still Advance Playback in reverse direction **(➜ 28)**
▷▷|/|◁◁:	Index Search in forward direction/ Index Search in reverse direction **(➜ 33, 34, 35)**
CHK:	Recording Check **(➜ 16)**
A.DUB ▷:	Audio Dubbing **(➜ 61)**
A.DUB ❚❚:	Audio Dubbing Pause **(➜ 61)**
PHOTO:	Recording in the Photoshot Mode **(➜ 20)**
BLANK:	Blank Search **(➜ 32)**
R ▷:	Repeat Playback **(➜ 25)**
2× ▷▷:	Variable Speed Search **(➜ 26)**
SLIDE ▷:	Slide Playback **(➜ 66)**
SLIDE ❚❚:	Slide Playback Pause **(➜ 66)**

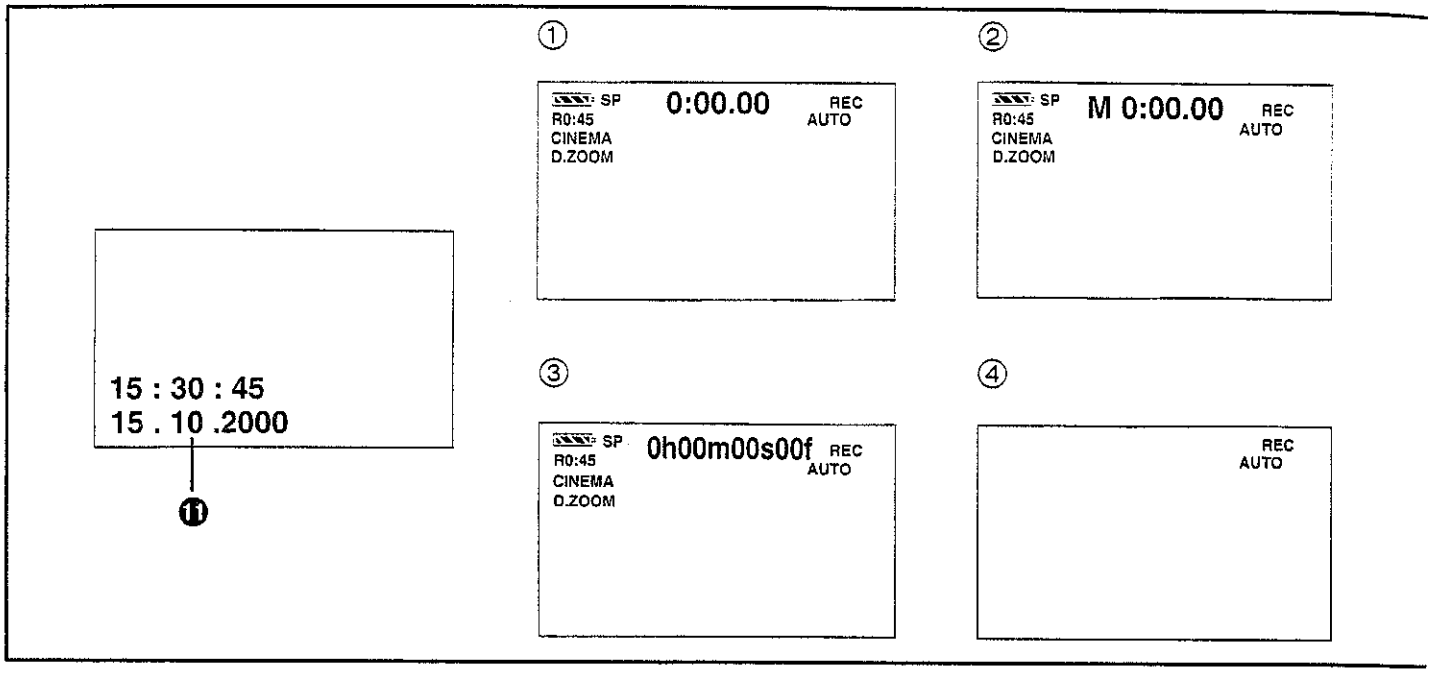
- When you record with the LCD Monitor facing forward using the Mirror Mode, none of the Tape Run Indications shown above appear. Only the Remaining Battery Power Indication, the Recording Indication [●] and the Recording Pause Indication [●❚❚] appear. If the [⚠] Indication apppears, turn the LCD Monitor so that it faces backward and then confirm the displayed warning message(s).

⑨ Shutter Speed

When you manually adjust the shutter speed, this indication is displayed. **(➜ 51)**

⑩ Iris Value (F Number)

When you manually adjust the iris, this indication is displayed. **(➜ 52)**



⓫ Date and Time
The time is indicated in the 24-hour system.

Making the Date/Time Indication Appear (→ 72)

This Movie Camera automatically records the date and time, however not directly in the picture but as part of the sub code **(→ 108)**.
To make the Date/Time Indication appear, set [DATE/TIME] on the [DISPLAY SETUP] Sub-Menu to the desired setting. It is also possible to make the Date/Time indication appear and change it by repeatedly pressing the [DATE/TIME] Button on the Remote Controller.

Changing the Indications

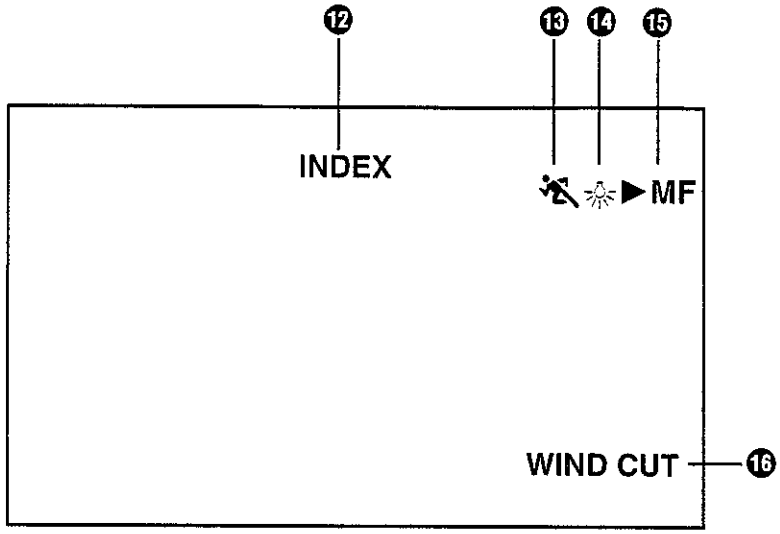
By changing the setting for [DISPLAY] on the [DISPLAY SETUP] Sub-Menu of the Main-Menu, the Counter Display Mode can be changed in the order shown in the above illustrations ①–④.

① Tape Counter Indication

② Tape Counter Indication with activated Memory Stop Indication

③ Time Code Indication

④ Simple Indication
(Only a few indications are displayed so that all parts of the picture can be seen clearly.)



⓬ Index (➜ 33)

INDEX: The [INDEX] Indication flashes for a few seconds while an index signal is being recorded.

Search Number (➜ 35)

S 1: The figure indicates which number of scene ahead from the present scene is to be played back.

⓭ Programme AE Mode (➜ 37)

The Programme AE Function offers the following settings:

- : Sports Mode
- : Portrait Mode
- : Low Light Mode
- : Spotlight Mode
- : Surf & Snow Mode

⓮ White Balance Mode (➜ 48)

The White Balance Mode offers the following possible settings:

- : Indoor Mode (recording under incandescent lamp)
- : Outdoor Mode
- : Last manually adjusted White Balance setting

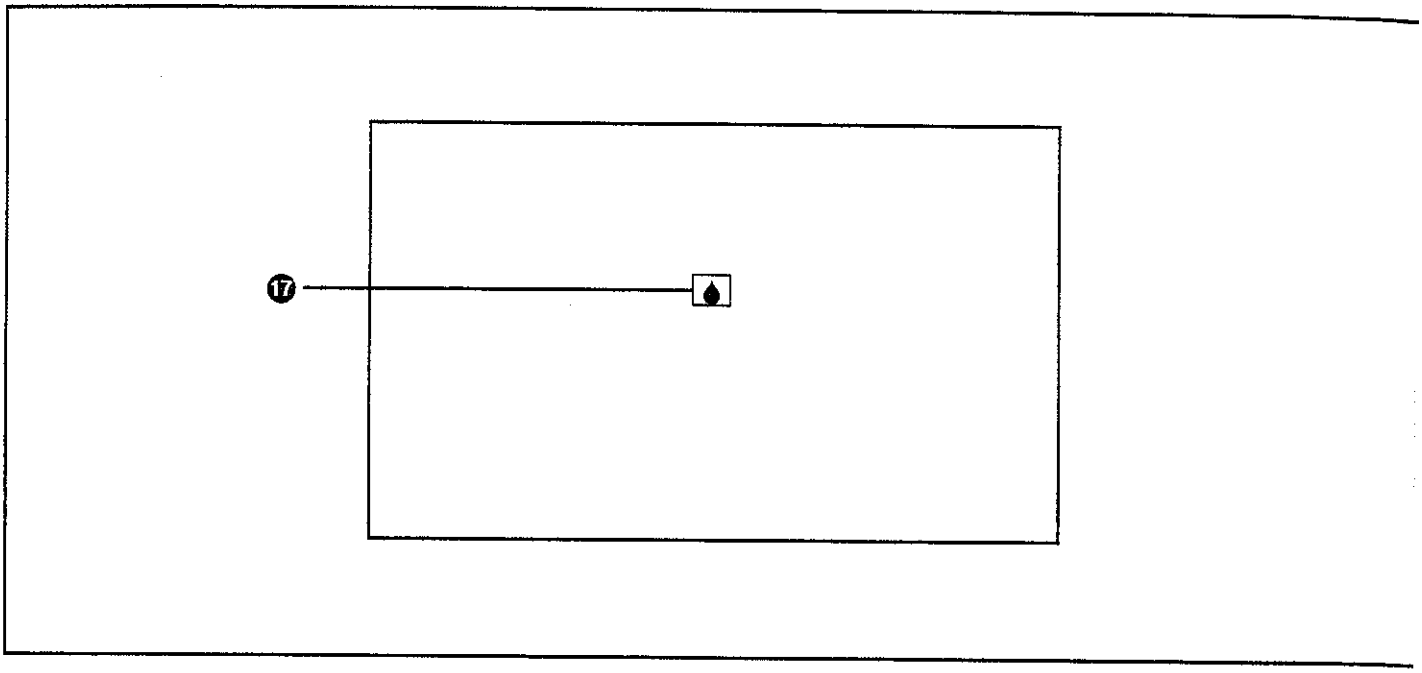
When the Movie Camera is in the Auto Mode, none of the above 3 indications are displayed.

⓯ Manual Focus (➜ 50)

If you select the Manual Focus Mode, the [MF] Indication is displayed.
When the Movie Camera is in the Auto Mode, this indication is not displayed.

⓰ Wind Noise Reduction [WIND CUT]

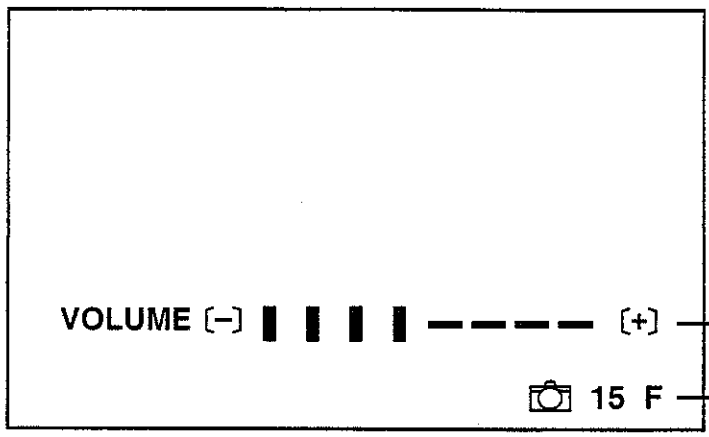
If you set [WIND CUT] on the [OTHER FUNCTIONS] Sub-Menu of the [CAMERA FUNCTIONS] Main-Menu to [ON], the [WIND CUT] Indication is displayed.



⓱ Warning/Alarm

When any of the following indications lights or flashes, confirm the condition of the Movie Camera.

- : Condensation has occurred. **(➔ 103)**
- : The erasure prevention slider of the inserted cassette is open (set to [SAVE]).
  Audio dubbing was attempted on an unrecorded (blank) part of the tape.
  No cassette is inserted.
- : The Battery is discharged. Charge it. **(➔ 9)**
- : The built-in battery is discharged. **(➔ 99)**
- : The video heads are dirty.
- END: During recording, the tape has reached its end.
- REMOTE: Wrong Remote Controller Mode is selected. **(➔ 77)**
- PRINTER ERROR: The Video Printer is not connected correctly, or there is some trouble on the Video Printer.
- UNPLAYABLE TAPE (OTHER FORMAT): Playback was attempted on a part of a tape recorded in a different Format.
- UNABLE TO A. DUB (LP RECORDED): Audio dubbing is not possible because the original recording was made in the LP Mode.
- INCOMPATIBLE TAPE: The cassette is incompatible.
- COPY INHIBITED: A programme that containes copyright protection signals (Copy Guard) is being recorded. The picture cannot be recorded correctly. **(➔ 79)**
- CARD FULL: There is not enough memory left on the MultiMediaCard.
- NO CARD: There is no MultiMediaCard inserted.
- NO PICTURE: There are no pictures recorded on the MultiMediaCard.
- CARD ERROR: The MultiMediaCard is not compatible with the Movie Camera. **(➔ 67)**



⑱ Sound Volume (➔ 25)
Use this indication to adjust the volume of the playback sound from the built-in speaker.
Slide the [OFF/ON/MODE] Switch from the [ON] position to put the Movie Camera in the VCR Mode and keep the [PUSH] Dial pressed until the [VOLUME] Indication appears.

⑲ Card Photoshot Picture Indications (➔ 64)
N (F, E): Volume of image data recorded on the MultiMediaCard (During Card Playback)
Picture quality selected for Card Photoshot pictures (During Card Photoshot Recording)

- [F] means data amount of approximately 128 KB, [N] of approximately 64 KB, and [E] of approximately 32 KB. However, the actual data volume per picture depends on how detailed the picture is, and the displayed Playback Picture Quality Mode may not be the same as the one selected for recording.
  [F] means Fine, [N] Normal, and [E] Economy.

[📷] (Red): During Card Photoshot recording
BUSY: During reading of the MultiMediaCard (playback, formatting, or while the Multi-Picture Function is used)
[📷]: No MultiMediaCard inserted
[📷] (Cyan): Ready for Card Photoshot recording
No. 00: Number (file number) of the Card Photoshot picture being played back
00: Remaining number of Card Photoshot pictures

Before Requesting Service (Problems & Solutions)

Power Supply

P1: The Movie Camera does not turn on.

S1: Is the Battery or the AC Adaptor connected correctly? Confirm the connection. **(➔ 8)**

P2: The Movie Camera has turned off automatically.

S2: If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. **(➔ 15)**

P3: The Movie Camera quickly turns off.

S3-1: Is the Battery discharged? When the Remaining Battery Power Indication is flashing or the [▭] Indication is displayed, the Battery is discharged. Charge the Battery or attach a fully charged Battery. **(➔ 9, 115)**

S3-2: Has condensation formed? If the Movie Camera is brought from a cold to a warm place, condensation may form inside. In this case, the Movie Camera automatically switches off and no operation can be performed except taking out the cassette. Wait until the Condensation Indication disappears. **(➔ 103)**

Battery

P1: The Battery discharges quickly.

S1-1: Is the Battery fully charged? Charge it with the AC Adaptor. **(➔ 9)**

S1-2: Are you using the Battery in a place where the temperature is very low? The ambient temperature greatly influences the Battery's performance. Its operation time becomes shorter in a cold place. **(➔ 106)**

S1-3: Has the Battery reached the end of its service life? The service life of the Battery is limited. It depends on the way the Battery is used, but when the operation time even after proper charging is too short for normal use, the service life of the Battery has reached its end.

P2: The Battery cannot be charged.

S2: If the DC Input Lead is connected to the AC Adaptor, charging is not possible. Disconnect the DC Input Lead.

Normal Recording

P1: Recording cannot be started even though the Movie Camera is supplied with power and the cassette is inserted correctly.

S1-1: Is the erasure prevention slider of the cassette open? If it is open (set to [SAVE]), recording is not possible. **(➜ 11)**

S1-2: Has the tape reached its end? Insert a new cassette. **(➜ 11)**

S1-3: Is the Movie Camera turned on? **(➜ 15)**

S1-4: Is the [VCR] Lamp or [CARD P.B] Lamp lit? If either lamp is lit, recording is not possible. **(➜ 15)**

S1-5: Is the Condensation Indication [[💧]] displayed? When condensation has formed, no functions except taking out the cassette can be operated. Wait until the Condensation Indication disappears. **(➜ 103)**

Other Recording

P1: The picture on the LCD Monitor/in the Finder suddenly stands still for a few seconds.

S1: Did you press the [PHOTO SHOT] Button? If you press the [PHOTO SHOT] Button, a still picture is recorded for approximately 7 seconds. After approximately 7 seconds, the Movie Camera switches back to the Recording Pause Mode. **(➜ 20)**

P2: The Auto Focus Function does not work.

S2-1: Is the Manual Focus Mode selected? If you select the Auto Focus Mode, the focus is adjusted automatically. **(➜ 50)**

S2-2: Is the subject or recording situation suitable for the Auto Focus Mode? The Auto Focus Function does not work correctly for some kinds of subjects and recording situations. In this case, use the Manual Focus Mode to adjust the focus. **(➜ 50)**

Editing

P1: Audio dubbing cannot be performed.

S1-1: Is the erasure prevention slider of the cassette open? If it is open (set to [SAVE]), editing is not possible. **(➜ 11)**

S1-2: Are you trying to edit parts of the tape recorded in the LP Mode? As the tracks recorded in the LP Mode are narrower than the heads, audio dubbing is not possible. **(➜ 12, 61)**

Indications

P1: The Time Code becomes incorrect.
S1: In the Slow Motion Playback Mode in reverse direction, the counter of the Time Code Indication may not be stable, however, this is not a malfunction.

P2: The Remaining Tape Time Indication disappears.
S2: If you record a still picture in the Photoshot Mode, the Remaining Tape Time Indication may disappear temporarily. However, if you switch the Movie Camera over to the Normal Recording Mode, it appears again.

P3: The Remaining Tape Time Indication does not match the actual remaining tape time.
S3-1: If scenes of less than 15 seconds are recorded successively, the remaining tape time is not indicated correctly.
S3-2: The Remaining Tape Time Indication may show a remaining tape time that is 2–3 minutes shorter than the actual remaining tape time.

Playback (Picture)

P1: No playback picture is reproduced when pressing the Play Button [▶].
S1: Is the [VCR] Lamp lit? When the [VCR] Lamp is not lit, no playback functions can be operated. **(➔ 25)**

P2: Mosaic-like patterns appear in the picture during Cue, Review or Slow Motion Playback.
S2: This phenomenon is a characteristic of the digital video system. This is not a malfunction. **(➔ 26, 27)**

P3: I want to play back the picture on a TV.
S3: Attach the Output Terminal Box [AV ONE TOUCH STATION] to the Movie Camera and use the AV Cable (PHONO-PHONO) to connect it to the TV. Or use the AV Cable (PHONO-M3) to connect the Movie Camera directly to the TV. **(➔ 29)**

P4: The Movie Camera is correctly connected to a TV, but no playback picture is reproduced.
S4: Did you select "Video Input" on the TV? Carefully read the operating instructions for your TV and select the channel that matches the input sockets used for connection.

P5: The playback picture is not reproduced clearly.
S5: Are the video heads on the Movie Camera dirty? If the video heads are dirty, the picture cannot be played back clearly.

Playback (Sound)

P1: No sound is played back from the Movie Camera's built-in speaker.

S1: Is the volume set too low? During playback, keep the [PUSH] Dial pressed until the [VOLUME] Indication appears. Then turn the [PUSH] Dial to adjust the volume. **(➜ 25)**

P2: Different sounds are played back together.

S2: [12bit AUDIO] on the [OTHER FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu is set to [MIX]. Therefore, the original sound and the sound dubbed with audio dubbing are played back together. It is also possible to play them back individually. **(➜ 62)**

P3: The original sound was erased by performing audio dubbing.

S3: If you perform audio dubbing on a recording made in the [16bit] Mode **(➜ 61)**, the original sound is erased. If you want to keep the original sound, be sure to select the [12bit] Mode for the original recording.

P4: No playback sound is reproduced.

S4-1: Is [12bit AUDIO] on the [OTHER FUNCTIONS] Sub-Menu of the [VCR FUNCTIONS] Main-Menu set to [ST2] even though no audio dubbing has been performed on the cassette that you are playing back? When you play back a cassette onto which no audio dubbing was performed, [12bit AUDIO] must be set to [ST1]. **(➜ 62)**

S4-2: Is the Variable Speed Search Function activated? Press the Play Button [▶] to cancel the Variable Speed Search Function. **(➜ 26)**

MultiMediaCard

P1: The recorded pictures are not beautiful.

S1: Was [PICTURE QUALITY] on the [CARD SETUP] Sub-Menu set to [ECONOMY]?
If it was set to [ECONOMY], pictures with many fine details may contain mosaic-like patterns. Set [PICTURE QUALITY] to [NORMAL] or [FINE]. **(➜ 65)**

P2: When a picture recorded on the MultiMediaCard is played back, the displayed picture quality indication is different from that originally set for the Card Photoshot recording.

S2: The picture quality selected for recording and that displayed for playback may be different. This is normal and not a malfunction. **(➜ 121)**

P3: The played back Card Photoshot picture does not look normal.

S3: The image data may be damaged.
To prevent the loss of picture data, we recommend that you make a backup copy on a cassette **(➜ 70)** or on the computer **(➜ 71)**.

P4: The [×] Indication appears during playback.

S4: The picture was recorded in a different format or its data is damaged.

P5: Even after formatting, the MultiMediaCard cannot be used.

S5: The Movie Camera or the MultiMediaCard may be damaged. Consult with your dealer for servicing.

Others

P1: The cassette cannot be taken out.

S1-1: Is the Movie Camera supplied with power? Is the AC Adaptor correctly connected or the Battery correctly attached? To remove the cassette, the Movie Camera must be supplied with power, however, it is not necessary to set the [OFF/ON/MODE] Switch to [ON].

S1-2: The attached Battery may be discharged. Replace it with a charged Battery.

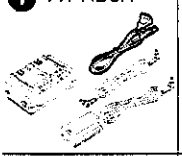
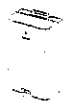
P2: No operation except taking out the cassette can be performed.

S2: Is the Condensation Indication [💧] displayed? If condensation has formed inside the Movie Camera, it automatically switches off and prevents all operations except taking out the cassette. Wait until the Condensation Indication disappears. **(➜ 103)**

P3: The Remote Controller does not work.

S3-1: Is the button-type battery in the Remote Controller exhausted? If the Remote Controller does not work when you use it near the Remote Controller Sensor on the Movie Camera, the button-type battery is exhausted. Replace it with a new battery. **(➜ 76)**

S3-2: Is the correct Remote Controller Mode selected? If the Movie Camera's setting for [REMOTE] on the Menu and the mode selected on the Remote Controller are not matched, operating the Movie Camera with the Remote Controller is not possible and the [REMOTE] Indication is displayed. **(➜ 77)**

❶ VW-AD9A 	❷ CGR-D120 (800 mAh) 	❸ CGP-D210 (1400 mAh)	❹ CGR-D220 (1600 mAh)	❺ CGP-D320 (2800 mAh)	❻ CGR-D815 (5300 mAh)	❼ VW-KBD2E	❽ VW-K10E
❾ VW-LW3007E	❿ VW-LT3014E	⓫ VW-LND30E	⓬ VW-LMC30E	⓭ VW-VMS1E	⓮ VW-SK11E	⓯ VZ-CT55E	⓰ VW-EC500E
⓱ VW-EC1E	⓲ VW-VT1A	⓳ VW-CH1E	⓴ VW-DTA10A	㉑ VW-DTA9E	㉒ VW-K5E	㉓ VW-CD1E	㉔ VW-RWM1E
㉕ VW-MAP1E	㉖ VW-MMC8E	㉗ VW-MMC16E					

Optional Accessories

- ❶ AC Adaptor
- ❷–❻ Battery Pack (Lithium-ion)
- ❼ Car Battery Charger
- ❽ 5-Pin Synchro Cord
- ❾ Wide Conversion Lens
- ❿ Tele Conversion Lens
- ⓫ ND Filter
- ⓬ MC Protector
- ⓭ Stereo Zoom Microphone
- ⓮ Shoe Adaptor
- ⓯ Tripod
- ⓰–⓱ Editing Controller
- ⓲ Video Titler
- ⓳ Headphone Conversion Adaptor
- ⓴–㉑ Personal Computer Connection Kit
- ㉒ Edit Cable
- ㉓ DV Cable
- ㉔ MultiMediaCard External Drive
- ㉕ PC Card Adaptor
- ㉖–㉗ MultiMediaCard

•Some accessories are not available in some countries.

Specifications

Digital Video Camera Information for your safety

Power Source:	DC 7.9/7.2 V
Power Consumption:	Recording 4.3 W (When using Finder) 5.1 W (When using LCD Monitor)
Recording Format:	Mini DV (Consumer-use Digital Video SD Format)
Tape Used:	6.35 mm digital video tape
Recording/ Playback Time:	SP: 80 min. LP: 120 min. (with DVM80)
Video Recording System:	Digital Component
Television System:	CCIR: 625 lines, 50 fields PAL colour signal
Audio Recording System:	PCM Digital Recording 16 bit (48 kHz/2ch), 12 bit (32 kHz/4ch)
Input Sensitivity/ Impedance:	MIC IN (M3)–70 dBV/5.6 kohm
Image Sensor:	1/4-inch CCD Image Sensor
Lens:	Auto Iris, F1.8, Focal Length; 3.7–55.5 mm, Macro (Full Range AF)
Filter Diameter:	30.5 mm
Zoom:	15:1 Power Zoom
Monitor:	2.5-inch LCD
Finder:	Colour Electronic Finder
Microphone:	Stereo
Speaker:	1 round speaker ∅ 20 mm
Standard Illumination:	1,400 lx
Minimum Required Illumination:	1 lx (Digital Gain-up Mode)
Video Output Level:	1.0 Vp-p, 75 ohm
S-Video Output Level:	Y Output: 1.0 Vp-p, 75 ohm C Output: 0.3 Vp-p, 75 ohm
Audio Output Level:	316 mV, 600 ohm
Digital Still Picture:	Digital Still Picture Output, Control Signal Input/Output (Transfer rate: max. 115 kbps)
Digital Interface:	DV Input/Output Terminal (i.LINK, 4pin)
Dimensions:	Approx. 47 (W)×94 (H)×129 (D) mm
Weight:	Approx. 490 g (without Battery and DV cassette) Approx. 570 g (with VSB0418 and DVM60)
Operating Temperature:	0°C–40°C
Operating Humidity:	10%–80%

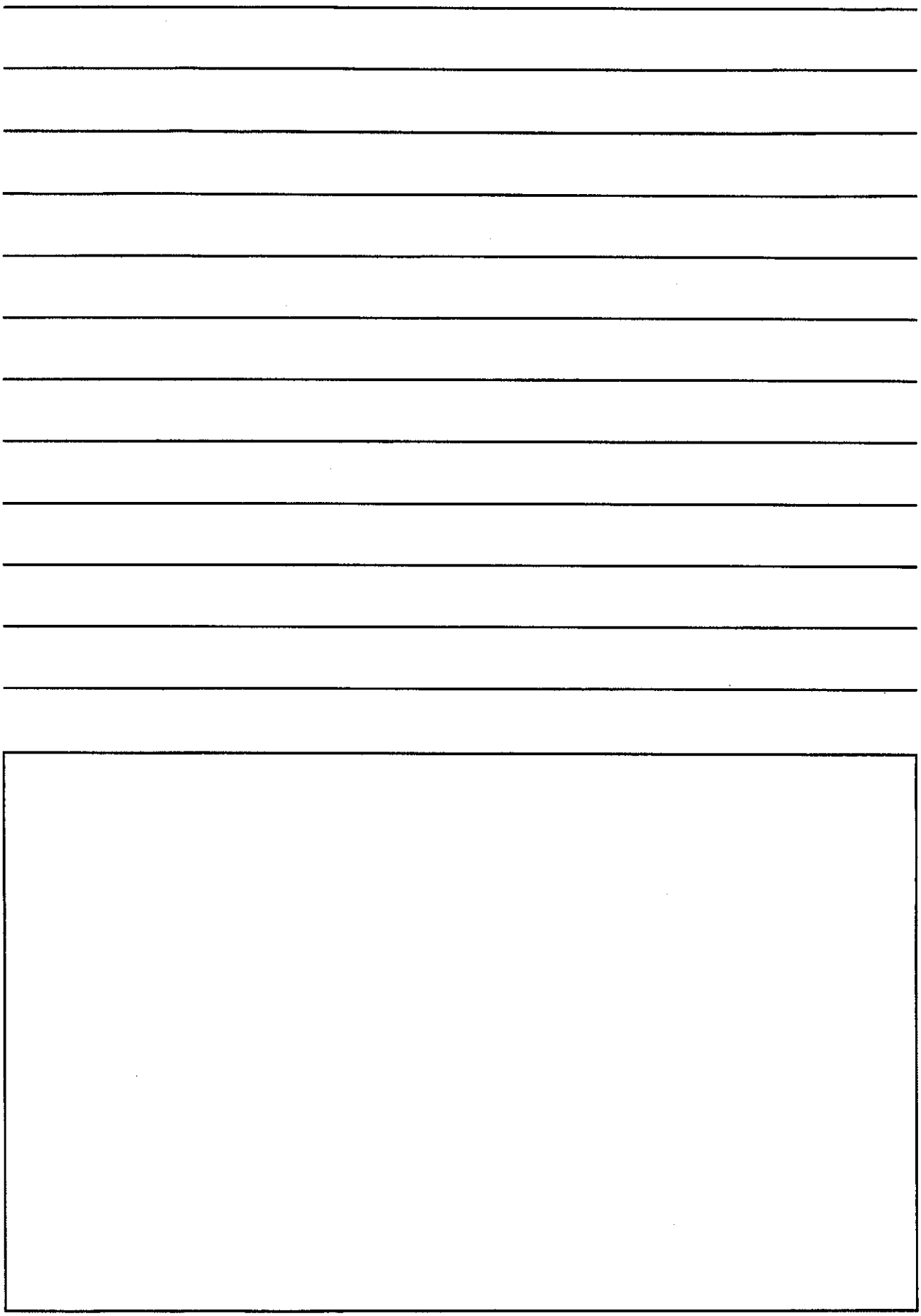
CardMemory Functions

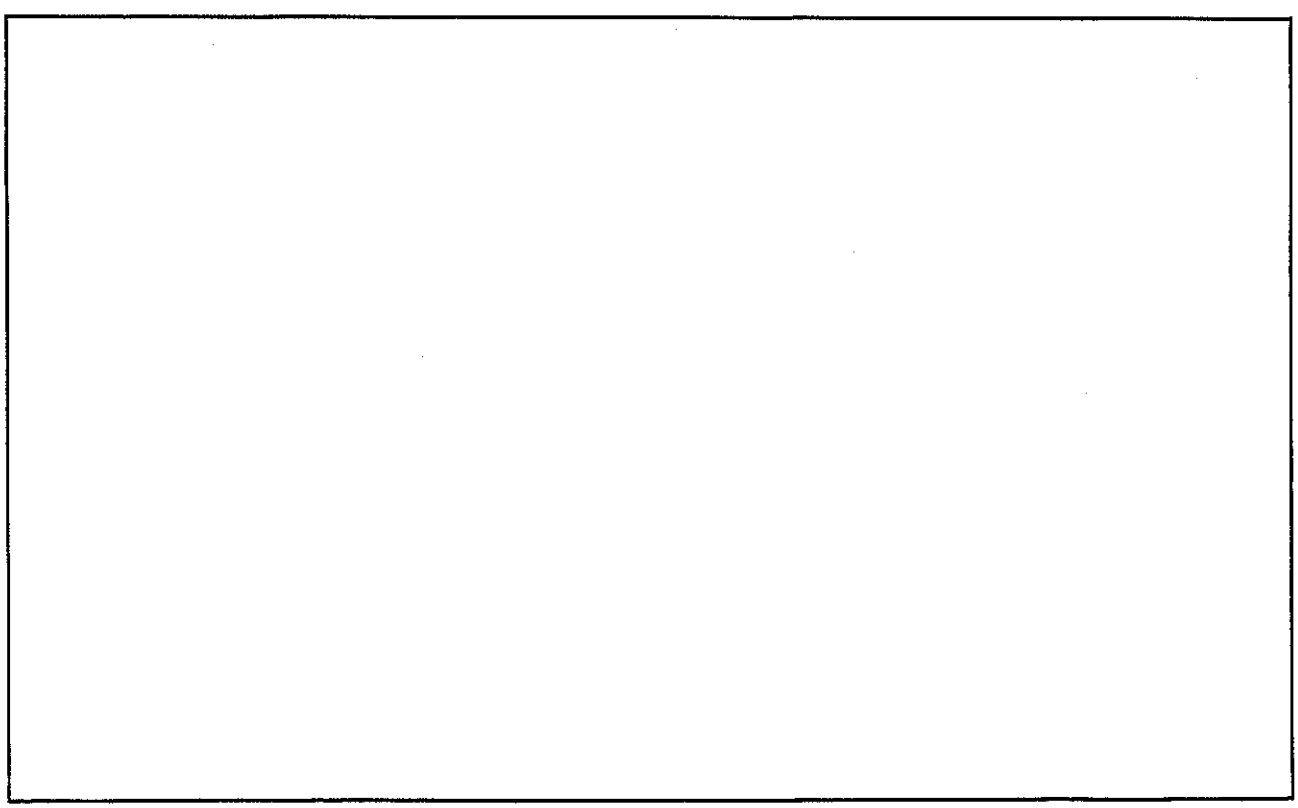
Recording Media:	MultiMediaCard
Imagecompression:	JPEG

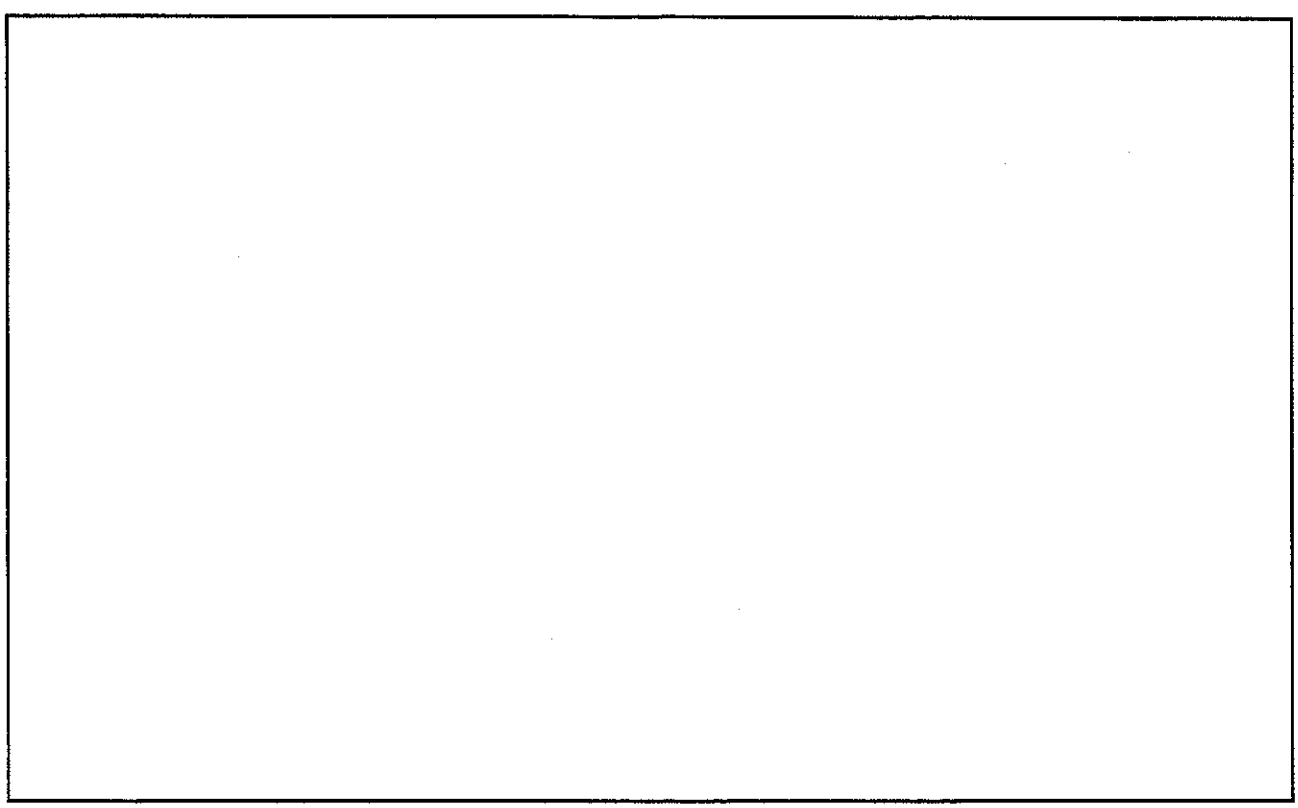
AC Adaptor Information for your safety

Power Source:	AC 100–240 V, 50/60 Hz
Power Consumption:	20 W
DC Output:	DC 7.9 V, 9 W (Movie Camera Operation) DC 8.4 V, 1.2 A (Battery Charging)
Dimensions:	72 (W)×50 (H)×143 (D) mm
Weight:	Approx. 240 g

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.







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Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan